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S. Hrg. 103-273

STATE AND LOCAL COMPLIANCE WITH TITLE I OF THE CLEAN AIR ACT

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State and Local Compliance with Tit...

HEARING

BEFORE THE

SUBCOMMITTEE ON
CLEAN AIR AND NUCLEAR REGULATION
OF THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

AUGUST 3, 1993

Printed for the use of the Committee on Environment and Public Works

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STATE AND LOCAL IMPLEMENTATION OF TITLE I OF THE CLEAN AIR ACT

TUESDAY, AUGUST 3, 1993

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR REGULATION,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:33 a.m. in room SD-406, Dirksen Senate Office Building, Hon. Joseph I. Lieberman [chairman of the subcommittee] presiding.

Present: Senators Lieberman and Baucus.

OPENING STATEMENT OF HON. JOSEPH I. LIEBERMAN, U.S. SENATOR FROM THE STATE OF CONNECTICUT

Senator LIEBERMAN. Good morning and welcome to this hearing of the Subcommittee on Clean Air and Nuclear Regulation which today will be addressing issues related to the implementation of the Clean Air Act.

I believe I will be joined during the morning by various other members of the committee.

I wanted to start promptly because there are a series of votes that are coming up in the Senate chamber around 10 o'clock, I believe four in number, so we'll go as far as we can until that time and then break for a while and then come back.

Today's hearing is the first in-depth review of the implementation of the Clean Air Act amendments which has been undertaken by this committee. We will focus today on State and local implementation of the provisions of the Act contained in title I which are designed to bring areas into compliance with the Federal health-based standards for ozone, carbon monoxide, and particulate matter. We also will examine scientific and health issues related to those pollutants.

Based on recent studies by researchers at the Harvard School of Public Health and EPA, it has been estimated that between 50,000 and 60,000 premature deaths a year are caused by pollution from small respirable airborne particles known as particulate matter which are emitted without violating the current standard. Today, we're going to hear from the Dean of Academic Affairs at the Harvard School of Public Health about these troubling recent studies.

While this news on particulate matter pollution may be particularly grim, in other areas, I think we're beginning to reap the benefits of the Clean Air Act Amendments. EPA's data show that emissions of the pollutants that contribute to ozone are down

during the period of 1990 to 1991, with emissions of volatile organic compounds down with 4 percent and oxides of nitrogen or NO_x down by 3 percent. The number of violations of the ozone standard fell during this period. Many areas are now meeting the health-based standard for carbon monoxide.

Today, representatives of the States who will testify will tell us that much of this improved air quality is the result of the Clean Air Act and that, of course, is good news. At the same time, during the heat wave of this summer, residents of the northeast experienced many periods of very unhealthy air.

The provisions of title I of the Act are of special concern to me because Connecticut has the unfortunate distinction of being the only State where the air quality in the entire State violates the health-based standard for ozone. Ozone pollution impairs our breath and keeps us indoors, can inflict permanent and irreversible injury on people gradually limiting their lung function and triggering emphysema and chronic bronchitis.

Effective implementation of the Clean Air Act is a daunting task. It's a big job and it's appropriate today that we are hearing from those individuals who are on the front line in the implementation process, namely State and local officials. Whether citizens in our polluted cities will breathe smog-free air depends on the timely and adequate implementation of graduated control measures.

While the Act contains deadlines for achieving the health-based standard, the critical emphasis is not simply on achieving the deadlines but on what happens in the period before the deadlines. One of Congress' major goals in adopting this legislation was to avoid the mistakes of the past where deadlines came and went. The 1990 amendments emphasized incremental progress over defined periods of time with remedial measures going into place if progress is not achieved.

This November, we come to an important date in the Clean Air Act implementation. That is when States are required to demonstrate that they will achieve a 15 percent reduction in emissions of volatile organic compounds by 1996. This obviously is a critical milestone and we're going to be interested today in learning from our State witnesses their strategies for meeting this reduction.

We will also hear positive news today about the States progress on implementation. Two-thirds of the submittals that were due last November were submitted on time and the States expected most other submittals will be made within the next several months. We're also going to hear that most States are far along toward finalizing their 15 percent reduction plan.

EPA has obviously a critical role to play in assisting States to bring about the 15 percent reduction. We've asked the States today to review EPA's performance of its responsibilities under the Act and to tell us where EPA could be doing a better job to assist them.

I am disappointed, I want to say at the outset, from my reading of the testimony submitted by the State and local officials at the poor marks EPA receives from the State officials, both in terms of timeliness and quality of decision making. It is true that many of these decisions were made by the previous Administration and I await the new Administration's response, not just in words, but in actions.

We're also going to examine the work today of one of the most important provisions in the bill for the northeast and mid-Atlantic States and that is the Ozone Transport Commission which is particularly important to States like mine whose air quality is so drastically affected by what blows in from other States.

The Act uniquely established a commission of 11 northeast and mid-Atlantic member States and has placed additional controls on sources of pollution in those States to help reduce pollution that travels to other States within the region. From what I have heard, I'm pleased to say that the Ozone Transport Commission thus far has been a tremendous success story and may, in fact, be a good model for dealing with other forms of interstate pollution. The States are working together in the Commission to develop joint strategies to reduce emissions from motor vehicles, to burn cleaner fuels in those vehicles, and to reduce emissions of NO_x in a cost effective manner.

I'm particularly pleased that my own Commissioner of the Department of Environmental Protection, Tim Keeney, is testifying today on behalf of the Ozone Transport Commission. If I may borrow from the statement that Commissioner Keeney made in May, which was Clean Air Month in Connecticut,

> With the Clean Air Act of 1990, Congress recognized that air pollution is a significant health problem demanding solution. We will be the beneficiaries of the results. Mandatory programs will affect us all but every one of us must enlist in the effort.

It's in that spirit that we conduct this first of the oversight hearings on the implementation of the Clean Air Act.

I am happy to welcome the Chairman of the full committee, Senator Max Baucus, whom I presume everyone in this room knows, was also the leader in the passage of the Clean Air Act Amendments of 1990.

Senator Baucus?

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator BAUCUS. Thank you very much, Mr. Chairman.

First, I want to thank you for holding this subcommittee hearing. I look forward to the series of hearings on the Act to determine how well it is working and what remains to be done. I also want to thank the witnesses for coming to spend some time and effort to improve this process. I deeply appreciate your efforts.

Mr. Chairman, when I became Chairman of the full committee earlier this year, I decided before the committee jumped head first into reauthorizing our various environmental statutes, we needed to take a step back, that is to evaluate the progress we have made over the past several decades in meeting our environmental challenges—what works, what doesn't work, how can the matters that don't work be fixed—so at the beginning of the year, our committee held a series of what I called taking stock hearings. We heard from Government agencies, industry groups, environmental groups, and many others.

I think those taking stock hearings have been useful to us in helping to do a better job as we reauthorize our environmental statutes and also as we hold oversight hearings over such statutes as the Clean Air Act.

The Taking Stock hearings have, I think, demonstrated two very important matters thus far, first, while we have made a great deal of progress during the last 20 years in tackling many of our environmental problems, we now face new ones which are much more subtle, much more complex, and much more politically challenging than those faced in the past 20 years.

At our last taking stock hearing held several weeks ago, we heard from two former EPA Administrators, Bill Ruckelhaus and Russell Train, as well as from two chairs of President Clinton's Commission on Sustainable Development, Jonathan Lash and David Bazelli. While they disagreed on many issues, there was a striking consensus among those four panelists that of all of our environmental statutes, the Clean Air Act is one of the most effective laws that has been passed to improve the quality of the environment.

The Clean Air Act historically has been successful in addressing some of the major environmental problems in our Nation such as virtually wiping out air pollution caused by lead. That's a major success that we all should take note of and be proud of. The fate of the Clean Air Act amendments of 1990 is still up in the air because what that innovative legislation promised, I think, is largely yet unfulfilled.

I'm particularly interested in the implementation of title I of the Act which is the subject of today's hearing. One of my main concerns is that in passing the amendments in 1990, only a very few State implementation plans are being reviewed by EPA and that the review time of the agency was excessive. As we begin oversight of the implementation of the amendments, it is fitting to start by examining that fundamental part of the Act. That is, did the 1990 amendments approve the process, has EPA sped up review of State submissions, are States complying with new deadlines in the Act, and does the Act really have teeth?

I regret to say the preliminary assessment and the preliminary answer to all those questions may well be not well enough or not good enough.

Mr. Chairman, this is not the time, in my opinion, to pat ourselves on the back for passing an effective law or alternatively, to point the fingers of blame where the job has not been done to our satisfaction. Rather, it is time to get to the bottom of what is working, what is broken in the process of implementing the amendments and how to fix it.

From 1982 to 1992, only minimal gains were made in reducing the emissions of five of the six most prevalent air pollutants. For example, during that time, ozone emissions decreased by only 13 percent; particulate matter emissions decreased 5 percent; and sulfur dioxide emissions decreased 2 percent. No one believed we could reverse adverse trends in air pollution overnight. In fact, the attainment provisions of the Act's amendments recognize that to make significant progress would take time. The work must begin in earnest now. It should have started sooner but obviously tomorrow is not too late.

So today I challenge the EPA, I challenge State and local governments, all to the Clean Air Act implementation. I challenge the Congress, all of us, to take stock of whether we all have done what

we could do to live up to our responsibilities under the Act. I particularly challenge Administrator Browner to dig deep into her agency's resources and make a firm commitment to this committee and to the Congress that implementation of the Act will be a top priority for her at the EPA.

The bottom line, Mr. Chairman, is we have an opportunity here. Since we're at the point where we're conducting the first major oversight hearing of the Act to make sure it works, this is an opportunity to reverse a trend which I think has too long occurred in this Congress, namely Congress passes statutes, basically forgets them, goes on and passes another statute, forgets about that statute, and so on. I think that under the precedent of reconciliation which we're now going through and even the hard discretionary spending freezes, that we're in kind of a zero-based system, zero sum gain, if you will, where it makes much more sense for us to do a much better job with the statutes we have passed which is basically the subject of this and other hearings rather than to keep enacting new statutes which is theoretically one solution over another but sometimes layers another problem on top of another.

I commend you very much for your hearing.

Senator LIEBERMAN. Thank you very much, Mr. Chairman.

I agree with you 100 percent and that's entirely the spirit of these proceedings, to make sure that we're implementing the Act appropriately, and in that sense, that we're basically not avoiding inefficiency but we're proving that we can make something work from Washington with the help of a lot of folks out there.

Let's begin with the panel now. I'm going to run the 5 minute clock on everybody. I'd ask you to keep it as close to 5 minutes as you can in light of the time pressures and then we'll have a period for questioning. If you're not quite finished at the end of the 5 minutes, we will not forcibly remove you from the microphone, not soon after the 5 minutes anyway.

Mr. Thomas Allen is the Director of the New York State Department of Environmental Conservation, Division of Air Resources, here this morning on behalf of the State and Territorial Air Pollution Program Administrators. Mr. Allen, thanks, and we look forward to your testimony.

STATEMENT OF THOMAS M. ALLEN, DIRECTOR, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, ON BEHALF OF THE STATE AND TERRITORIAL AIR POLLUTION PROGRAM ADMINISTRATORS

Mr. ALLEN. Thank you.

Good morning. My name is Tom Allen. I am the Director of the New York State Division of Air Resources. I appear today on behalf of STAPPA and ALAPCO, the two national associations of air quality officials in the 55 States and Territories and more than 165 major metropolitan areas across the country.

I am very pleased to have this opportunity to present the Association's perspective on implementation of Title I of the Clean Air Act.

First, I'd like to applaud you, Senator Lieberman, and you, Senator Baucus, and your colleagues for the role you have played in the

development of the Clean Air Act Amendments of 1990. In spite of the daunting responsibilities which we have in front of us, we believe we are fortunate to have the comprehensive and effective statute and we remain committed to successful implementation of the Clean Air Act.

As we near the end of our third year of the implementation of title I, we are beginning to reap the benefits of our efforts. In many areas, emissions of ozone precursors, carbon monoxide and other criteria pollutants are decreasing. While favorable meteorological conditions may have played a role, much of the enhancement can indeed be attributed to measures embodied in the Act. Notwithstanding these successes, we face an enormous and arduous task.

Mr. Chairman, you have specifically asked that we provide the committee with a status report on the State implementations plan submittals that were due November 15, 1992, as well as a summary of the headway States are making in submitting the 15 percent rate of progress plans due this November.

With respect to November 1992 deadlines, States collectively were required to submit to EPA over 1,000 elements ranging from employee commute option programs to small business technical assistance programs. While States submitted approximately two-thirds of the required elements by November 15th, we now expect that most will fulfill their entire obligations within the next several months and certainly before sanctions take effect.

More recently, we have made considerable efforts to develop plans due by November 15, 1993 for reducing emissions of smog forming, volatile organic compounds by 15 percent. We believe this requirements represents one of the most critical responsibilities currently facing ozone attainment areas. As a deadline for submitting 15 percent plans nears, the change of identifying, qualifying and implementing measures sufficient to achieve such a reduction are becoming increasingly apparent, particularly in light of the absence of the anticipated Federal regulations and control technology guidance for many heretofore uncontrolled sources of pollution.

These delays have caused tremendous uncertainty for many States, particularly where agencies are relying upon the emission reductions expected from these measures. Without timely issuance of EPA regulations and guidance, it will become extremely difficult for States not only to predict what measures they will need to demonstrate the 15 percent reduction, but to adopt these measures ins rule by November 15, 1993.

Notwithstanding the Federal delays, we recognize that we must still comply with the law. Accordingly, we are taking our responsibility very seriously. Staff of ALAPCO, in cooperation with EPA, are preparing a guidance document intended to assist State and local air pollution control agencies in developing their 15 percent plans by November. For many areas, reducing BOC emissions by 15 percent by 1996 will necessitate the implementation of innovative air pollution control strategies. In fact, most areas will not have the luxury of ignoring any strategy that has been determined to be technologically feasible and cost effective.

We anticipate that most agencies will submit 15 percent plans this November. For some, submission of a complete plan including a full set of adopted rules will be difficult. While we have tried, in

good faith, to meet the statutory obligations, some of us will simply need a little more time. We, therefore, are very grateful that Congress has the foresight to provide an 18-month delay before the necessary, nondiscretionary sanctions are imposed.

In our written statement, we have focused on two major Federal measures in particular that will be vital to our efforts to meet 15 percent requirements—transportation conformity and reformulated gasoline.

With respect to conformity, we commend you, Senator Lieberman, and your colleagues, Senators Baucus, Chafee, Durenberger and Moynihan for your letters to EPA Administrator Browner and DOT Secretary Pëna urging them to place a high priority on the development of a final transportation conformity rule that supports the subsequent direction taken by STAPPA and ALAPCO. In our alternative proposal for transportation conformity regulation, we actually propose an alternate regulation.

It is also important that EPA honor the agreement on reformulated gasoline reached nearly two years ago based upon a regulatory negotiation. The product of the negotiation which resulted from painstaking compromise was agreed to unanimously by all participants, including representatives of State and local air pollution control agencies, the oil industry, the ethanol-methanol industries, the automotive industry, environmental groups and the Bush Administration.

Unfortunately, last year certain constituents of the ethanol industry successfully lobbied President Bush to revise this agreement. This revision not only represented a breach of good faith but we strongly believe it would result in detrimental air quality impacts, particularly from the commingling effects to occur from the change. It is now critical that EPA honor its commitment to the regulatory negotiation and revert to the provisions in the original agreement on reformed gas.

Mr. Chairman, you have asked for suggestions on what EPA might do to assist our efforts in complying with the requirements of the Clean Air Act. I wish to offer the following. First, it is absolutely imperative that EPA publish rules in an expeditious manner since so many of our actions are directly dependent upon timely issuance of EPA regulations.

Second, it is extremely important that EPA make good decisions. If agency rules become so watered down that they are not capable of achieving appropriate emissions reductions in major air pollution sources, State and local agencies will be forced to compensate for this loss by imposing more stringent, and less cost effective regulations on other sources of pollution, perhaps small business.

Third, it is becoming increasingly evident that State and local agencies will be required to adopt rules well beyond the minimum Federal requirements. They are expected to attain them and attain the air quality standards. Accordingly, it is essential that EPA support these States to the maximum extent and empower them to pursue these additional strategies.

In conclusion, you have asked us to grade EPA's performance with respect to timeliness and substance of several regulations. STAPPA and ALAPCO believe it is important in our efforts to attain and maintain, and I stress the word maintain, a national

ambient air quality standard. We have identified five EPA regulations and have attached our assessment of EPA's performance to our testimony.

Once again, I appreciate the opportunity to testify today on behalf of STAPPA and ALAPCO and offer whatever assistance we can provide to continue the evaluation of this effort.

Thank you.

Senator LIEBERMAN. Thank you, Mr. Allen.

Next is Commissioner Keeney who I've already lavishly quoted, Commissioner of the EPA in Connecticut on behalf of the Ozone Transport Commission.

STATEMENT OF HON. TIMOTHY KEENEY, COMMISSIONER, DEPARTMENT OF ENVIRONMENTAL PROTECTION, STATE OF CONNECTICUT, ON BEHALF OF THE OZONE TRANSPORT COMMISSION

Mr. KEENEY. Good morning, Mr. Chairman.

My name is Tim Keeney and today I'm representing the Ozone Transport Commission, better known as the OTC.

Thank you for the opportunity to appear before you today. I'd ask the full text of my remarks be included in the record.

Title I of the Act created an ozone transport regional design to address regional ozone transport problems. The region includes 12 northeastern States, plus the District of Columbia, spanning from Virginia to Maine. The Commission was then organized according to statutory requirements. I'd like to discuss the major work the Commission has accomplished to date.

As a result of modeling work of the States in conjunction with support from EPA, the Commission has done much to date to evaluate the ozone problem in the region. Two important results to date include the following: one, the combined effects of VOC and NO_x emission reductions specifically required by the Clean Air Act are very effective in reducing ozone but they do not appear to be sufficient to reduce ozone concentrations to the level of ambient ozone standards throughout the region; and two, for additional controls beyond those specifically called for by the Act, NO_x emission controls appear to be more effective than VOC controls, though VOC controls need to continue to play a major role in core urban areas. These themes are consistent with the findings of the National Academy of Sciences' December 1991 report, "Rethinking the Ozone Problem and Regional Urban Air Pollution."

In addition to our modeling work, recent monitoring results underscore the challenge we face. Attachment 1 to my prepared statement shows a list of these exceedances over the Federal standard of 120 ppb through the middle of July.

In your letter of invitation, you asked specifically about our progress in submitting the State implementation plan revisions due November 15, 1992. We believe that we have done well in our efforts to meet the Act's requirements for these revisions despite substantial delays in EPA guidance and the number of requirements involved.

We have provided your staff with a report produced by the Commission in January of this year which summarizes our progress

with the 1992 submittals at that time. Items documented as incomplete in these reports have generally either been completed or are in the process of being completed.

Another major work effort of the Commission is to identify major control measures for consideration. Given our NO_x results to date and our commitment to NO_x controls as evidenced by an MOU on reasonably available control technology for NO_x, stationery sources in March of 1992, the Commission in January of 1993 directed the OTC Mobile and Stationary Area Source Committees to review additional NO_x emission control measures. Since that time, both committees have held meetings to consider such additional measures and we expect initial reports by the committee at our next meeting on October 19th.

The Commission has also given major priority to controlling mobile source emissions. Mobile source is the largest single contributor to ozone precursors within the region. Therefore, it's important to minimize the contributions of both at the time of purchase and as they are used. This philosophy is embodied in the MOU adopted by the Commission in 1992 on an overall, integrated mobile source strategy. These strategies include low emission vehicles, enhanced inspection maintenance, Federal reformulated gasoline, and transportation control measures.

We've made progress in all these measures but the one I'd like to talk about in detail is the low emission vehicle or LEV Program. The LEV Program has been a critical element of the Commission's efforts to date. The LEV Program was initiated by the State of California and under section 177 of the Clean Air Act, States have the authority to adopt California emission standards for vehicles sold in their States.

It is worth pointing out that the LEV provides both VOC and NO_x emission reductions. Such reductions are helpful for both attainment and maintenance of the ambient ozone standard. As a result, the Commission has consistently promoted the development and adoption of the LEV Program by OTC States. Our support for LEV is based on statutory requirements for attainment demonstrations in our State implementation plans which must also show a 3 percent annual emission reduction starting in 1996. In most OTC States, LEV has the potential to meet those requirements as early as 1998 and it is not clear where these reductions will come from without the LEV Program.

In part because of the central role of LEV in our ozone control efforts, the Commission, at its annual meeting in May of this year, decided to form an ad hoc committee to study how section 184(c)'s recommendation process can further the adoption of LEV on a region wide basis. Under section 184(c) of the Act, the Commission may recommend to EPA that it require particular control measures be adopted by the OTC States. EPA then has 9 months to act on the recommendation. The Commission has charged the committee which I chair with providing them with a report on the section 184(c) process along with specific recommendations at the fall meeting of the Commission scheduled to be held in Connecticut on October 19th of this year.

In summary, let me say this about LEV and the State Implementation Plan process. We believe the States should have choices and

strategies that need to be in their plans to reach attainment and section 177 gives us the choice on LEV. As a practical matter though, it is very difficult to see how we will be able to meet the requirements of the Act without LEV. We will need all the help possible from EPA and others to ensure effective implementation of LEV and other strategies to ensure attainment and maintenance of the ambient ozone standard.

Another area where the Commission has invested substantial time is that of emissions trading. During 1992 and 1993, the Commission, through its Stationary Air Source Committee, early reviewed emissions trading issues and experiences. As a result of this review, it decide to focus first on developing similar intrastate NO_x emission offset trading programs. The Commission's rationale was that before any meaningful interstate system could be considered, the major elements of the individual States programs had to mesh. In this way, the way that emission reduction credits or ERCs are calculated, created, certified and used would be essentially the same from State-to-State.

While it was not critical that each State develop their programs identically, the Commission decided to focus on those program elements of State programs that would ensure compatibility if we were to be successful in establishing an interstate program.

After several committee meetings, including one devoted to public comment, a memorandum of understanding was drafted based on the 11 common elements of interstate NO_x emission trading programs developed through committee deliberations and information from the public. This MOU was then approved on May 18, 1993. Ten of the OTC's member States signed the MOU at that time. The District of Columbia, Vermont and Virginia indicated that they needed more time to review and consultation. Since that time, Vermont has now signed the agreement.

We now intend to go forward with a full scale investigation of how an interstate NO_x emission offset trading program would be set up, including how to provide flexibility for new sources in attainment areas.

In conclusion, the challenges in front of the Commission are substantial to try to ensure long term attainment of the ozone standard for the northeast and mid-Atlantic States. To meet these challenges, the Commission has embarked on a balanced program of VOC/NO_x emission control based on both mobile and stationary control measures.

In addition to our own efforts, our successes will depend both on adequate funding and on the full support of EPA as we draft State implementation plan revisions which meet the requirements of the Act.

That concludes my prepared statement. I appreciate the opportunity to offer this testimony today. I'd be glad to answer any questions.

Senator LIEBERMAN. Thank you, Commissioner Keeney. We'll look forward to questioning after the panel.

Dr. Wallerstein, why don't you proceed and we'll see if we can get at least your testimony in before we go to vote.

STATEMENT OF BARRY WALLERSTEIN, ASSISTANT DEPUTY EXECUTIVE OFFICER OF PLANNING AND TECHNOLOGY ADVANCEMENT, SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Dr. WALLERSTEIN. Thank you.

For the record, my name is Barry Wallerstein. I'm the Assistant Deputy Executive Officer of Planning and Technology Advancement for the South Coast Air Quality Management District.

The District is the regional agency with primary responsibility for air pollution control in the South Coast Air Basin in the metropolitan Los Angeles area.

I'm pleased to report to you that in Southern California, the 1990 Clean Air Act Amendments are working relatively well. For our region, 14 of the 15 major SIP submittals required by November 15, 1992 were provided to EPA. These submittals are summarized in Exhibit 2 of my written statement. The remaining item, enhanced inspection and maintenance, is actively being developed with two bills pending before the California Legislature. Work is also well underway on the next round of seven submittals which District staff will deliver to EPA by the prescribed November 1993 deadline.

The letter of invitation to today's hearing asked me to specifically comment on the status of one of these submittals for November 1993, specifically the 15 percent VOC Reduction Plan. Our preliminary analysis indicates that our region will be able to demonstrate a 15 percent reduction in VOC emissions between 1990 and 1996 and show that the 3 percent post-1996 reduction requirement is achievable.

For the 15 percent plan and our other control strategy submittals, pollution prevention measures are playing an important role. We have instituted the use of a wide range of such measures including technology-based actions, transportation control measures, and pollution prevention, guidance and outreach programs.

The invitation to today's hearing also requested our comments on whether EPA has met its obligations to issue guidance and adopt Federal measures. This is the principal area of concern for our region relative to the current implementation of the Act or the lack thereof.

The Clean Air Act and our regional Air Quality Management Plan call on EPA to adopt regulations to control emissions from pollution sources which are in its sole jurisdiction. This includes as yet relatively uncontrolled emissions from trains, ships, planes and some internal combustion engines. Our region's ability to reach attainment is wholly dependent on EPA's success or failure at controlling emissions from these sources. To date, there has been very limited activity related to developing the necessary regulations. Without EPA action, as much as 65 tons per day of oxides of nitrogen and 23 tons per day of VOC emissions control called for in our Air Quality Management Plan could be foregone.

Our other significant area of concern relates to EPA guidance. As you know, EPA has missed several deadlines specified in the 1990 amendments. While this has not created any insurmountable

problems at this time, further delays in guidance could adversely affect implementation of the 1990 amendments.

Last, it's important to note that the South Coast Air Basin's ability to comply with the 1990 amendments is also dependent on the use of section 110(k)(4) of the Act which provides for conditional approval of SIP submittals and their elements. Since our attainment strategy is based on full utilization of known technology as well as technological breakthroughs, it is not possible to put each of the more than 100 identified measures for the ozone attainment strategy into regulatory form at the time of SIP submittal. The submittal could, nonetheless, be approved under section 110(k)(4). Such an action would allow us an additional 12 months from conditional approval to provide the measures in regulatory form which would represent expeditious action by our region.

In conclusion, the South Coast Air Quality Management District appreciates this opportunity to appear before the subcommittee on these issues of critical importance to our region. At the Federal level, we recommend the following four actions to assist State and local agencies in implementing the 1990 amendments: first and foremost, expeditious adoption of emission control requirements for pollution sources solely within EPA's jurisdiction; second, reasonable but strict interpretation and implementation of the 1990 amendments, including appropriate use of Section 110(k)(4); third, more timely issuance of EPA guidance; and fourth, avoidance of any unnecessary preemption of State or local regulations which are at least as stringent as intended or adopted Federal requirements.

We appreciate the subcommittee's continue congressional oversight in these matters and believe that periodic but regular hearings such as this are important to providing healthful air to all Americans.

That concludes my testimony. I'll be happy to answer any questions the subcommittee may have.

Senator LIEBERMAN. Thank you, Dr. Wallerstein.

Ms. Hartsock, do you think you can do it in five minutes?

Ms. HARTSOCK. I can give it a try.

Senator LIEBERMAN. Let's give it a try.

STATEMENT OF BEVERLY HARTSOCK, DEPUTY DIRECTOR, GOVERNMENT AND COMMUNITY AFFAIRS, TEXAS AIR CONTROL BOARD

Ms. HARTSOCK. Good morning.

My name is Beverly Hartsock and I'm a member of the Texas Air Control Board staff. We're pleased to provide testimony before the committee this morning.

In describing for you our experiences regarding implementation of the nonattainment area programs of title I, it's important to provide you some background on the air quality problems that we currently face.

As is true in most of the country, ozone is the most pervasive pollutant problem in Texas. We have four major urbanized areas that have been listed as nonattainment. These include Dallas, Ft. Worth, El Paso, Beaumont, Port Arthur and the Houston-Galves-

ton area. Working to solve the nonattainment problems in these areas represents four very different and unique challenges.

Ozone is not the only pollutant for which we have experience in developing and implementing new control programs, however. El Paso, Texas is also a nonattainment area for carbon monoxide and for particulate matter.

Mr. Chairman, you asked that we specifically address certain points. The first of these was how we have done in meeting the deadline set out by the 1990 amendments and the EPA rules and guidelines promulgated thereunder. I am pleased to report that to date Texas has met all of its deadlines. This includes 38 separate program submittals. We are proud to note this accomplishment. We realize that many other States have not met all deadlines and we understand their difficulties. The scope and timetable of actions set out by the statute for EPA and the States have been extremely challenging.

The second question you raised follows on from the first, how are we doing in meeting our deadlines and goals for this year? We believe that we are on target in accomplishing the 1993 goals of Title I. We have developed emissions inventories for each of our ozone areas, have adopted new control programs, are in the process of analyzing and adopting additional controls for volatile organic compounds and nitrogen oxide emissions from large and small businesses and from motor vehicles. In addition, we are proceeding with gathering extensive air quality data and conducting urban air shed monitoring. We believe we will be in a position to submit to EPA by November 15th, a plan for each of our four ozone nonattainment areas that demonstrates significant emission reductions that will occur by 1996.

Although formal rules governing all proposed new control measures may not be complete by the November 15th date, we will continue to work to complete all elements as soon as possible.

We are currently completing the SIP revisions due to be submitted in November. A series of public hearings will be held in each of our four nonattainment areas later this month. We expect to receive significant public testimony on these issues. The final plans adopted will be based on consideration of the technical data developed by the staff and the comments, support and concerns expressed by the local communities and their representatives.

The third question you posed to us related to EPA's activities in implementing the 1990 amendments. The point that EPA has not met all of its deadlines under the Act is not new information. Furthermore, there is no surprise associated with States expressing concerns at lack of timely guidance from EPA which often makes our jobs more difficult and, in some cases, impossible to do.

It is also true, however, that EPA has, in many ways, been of invaluable assistance to the States by providing needed guidance in developing rules for several new programs and assisting States to interpret and develop program approaches to provide national consistency.

One major difficulty that is not often highlighted occurs when States complete requirements prior to receiving final EPA guidance. Often the guidance will have changed during the finalization process, necessitating State rule changes for consistency or approv-

ability. It is costly and time-consuming to make these changes and it adds an element of uncertainty to the process that can be disruptive to cost effective planning by the regulatory community.

Next, we were asked for suggestions as to areas in which EPA assistance would be most useful to the States. In general, we believe that many times EPA focuses too much on detailed procedures rather than on the end result or air pollution goal to be accomplished. This serves to mire guidance development work in detail and impedes national decision making by trying to cope with all manner of State and local differences. Delegation of more authority to EPA regional levels may also assist in improving the decision process.

EPA should also work to expedite national rulemaking on source categories with interstate markets and impacts such as small engines, pleasure boats, construction equipment, aircraft and airport operation. National attainment goals will not be met without these sectors of our economy shifting to more environmentally sound practices.

I hope that these comments will be useful to you in your view and oversight of State and Federal efforts to implement the provisions of the Federal Clean Air Act. In 1990, you enacted far-reaching changes to the National Air Quality Program and sent a strong message to the country that the goal of clean air for all of its citizens was not to be ignored or deferred. We will continue to try our best to live up to your high expectations.

Thank you.

Senator LIEBERMAN. Thank you, Ms. Hartsock for that good report and for making it before the red light went on.

We will recess now and as I said earlier, I think there are three or four votes, so we'll probably be about a half hour before we return.

Thanks for your patience and your testimony.

The hearing will stand in recess.

[Recess.]

Senator BAUCUS. [presiding.] Senator Lieberman is on his way but in order to save time and also the time of the witnesses, let's go to the final witness on this panel, Caroline Garber with the Department of Natural Resources in Madison, Wisconsin.

STATEMENT OF CAROLINE GARBER, ASSISTANT DIRECTOR, BUREAU OF AIR MANAGEMENT, DEPARTMENT OF NATURAL RESOURCES, MADISON, WISCONSIN

Ms. GARBER. Good morning.

My name is Caroline Garber. I am the Assistant to the Director of the Bureau of Air Management of the Wisconsin Department of Natural Resources.

Mr. Theiler, the Director, sends his regrets for not being able to testify in person, there was a death in his family and he asked me to present his testimony for him.

We're very pleased to have this opportunity to testify before the subcommittee.

In Wisconsin, we have been diligently developing the necessary legislation, regulations and policies to meet the requirements of the

1990 Clean Air Act Amendments. Our 1992 SIP submittal was submitted on time and we fully expect to have all of the issues in the remaining final regulations resolved and submitted within the next few months.

We are on track to meet our 1993 SIP submittal also. We're working with an elaborate task force and work group structure. Wisconsin has successfully crafted a 15 percent strategy. The plan relies on Clean Air Act-mandated control measures for 13 percent of the 15 percent required reductions. We are very dependent on timely EPA regulation and guidance. Lack of final Federal guidance and regulations is a significant obstacle to complying with the Act. Delays and in some cases, an outright vacuum in guidance, can put us, the States, at severe risk of not being able to meet the deadlines. This makes us vulnerable to Federal sanctions and to lawsuits.

Let me cite some specifics. The Clean Air Act required EPA to issue control techniques guidance or CTGs for 13 VOC source categories by November 15, 1993. To date, none has been finalized and it appears now that EPA may not develop CTGs for several of the identified categories. Reductions from some of these measures are critical elements in Wisconsin's 15 percent plan and in those of many other States.

It is important to understand that politically, it is impossible or at least very difficult for an individual State to proceed to promulgate regulations in an area where EPA is working on guidance. If a State does proceed with regulations that are not stringent enough, there is a possibility that the affected sources might install pollution control equipment which is rendered obsolete when EPA disapproves the SIP revision because it doesn't measure up for the Federal guidance.

On the other hand, if the State regulations are more stringent than the Federal guidance, then the State is accused of placing the sources at a competitive disadvantage with those States which followed the Federal guidance. Both of these possibilities argue strongly for the State to wait for Federal guidance. When this is delayed, it causes the State to violate other deadlines.

If EPA does not issue the CTGs, then an additional burden is placed on the States because they have to develop and implement the regulations in a very compressed time period as a part of the 15 percent plan without the benefit of national guidance. This has two consequences.

One, it could result in inconsistent nationwide regulations for the same industry and second, it increases the strain on State resources that are already being stretched to meet the continuing obligations in the 1992 SIP, to develop the 1993 SIP, and to prepare the ozone attainment demonstration by November 1994.

We need EPA to issue the CTGs soon within 6 months. If they can't, we recommend that they should publicly declare that they won't and then announce that each State which needs the reductions from these categories is expected to develop its own regulations. They should also make it clear, and this is important, that if there is future EPA guidance, it will be designed so as not to penalize States who have been forced to develop their own regulations ahead of time.

Our experience has been that in those areas where we have little or no Federal guidance, Wisconsin has been able to move in a timely manner because our hands haven't been tied. It's not the optimum solution, but it's preferable to sanctions.

A second area of concern is dilution where the potential loss of credits because delays in Federal rulemaking have precluded full implementation of the program. As an example, the ongoing delay in finalizing the reformulated gasoline rules raises the possibility that these regulations will not be fully effective by the 1996 ozone season. This could severely hamstring the States' capability to implement the 15 percent plans because of the critical importance of these control measures. In Wisconsin, it makes up about a quarter of our necessary 15 percent reduction. The same is true with the delayed enhanced I&M rule.

We recommend that full program credit should be allowed in the 15 percent plans for authorized inspection and maintenance enhancement, fuel regulations and for those stationary and area source categories identified in the Clean Air Act Amendments unless EPA has publicly stated that they won't be issuing the guidance for them. The States should receive full credit for those where they can provide evidence of the authority and the wherewithal to rapidly promulgate and enforce the control requirements once they are finalized. In Wisconsin, we are fully prepared to develop the necessary SIP revisions within 12 months of receiving final Federal guidance.

We also recommend that EPA work with the States and the regions to set short term priorities that support States' needs and also that EPA should be provided with the staff and the necessary resources to meet its commitments.

In summary, Wisconsin is generally on course with the 1992 and 1993 submittals. However it's very clear that the 15 percent reductions will not be achieved in 1996 without the needed Federal actions. A solution satisfactory to all should be pursued as expeditiously as possible. Wisconsin puts forward these recommendations in order to assist in this regard.

I want to thank you for the opportunity to testify before this committee. We did submit written materials and I hope those are included in the record.

Senator LIEBERMAN. Thank you, Ms. Garber.

Thank you all on the panel. I appreciate that Senator Baucus reconvened the hearing before I came back.

We're going to run the timer on ourselves as well to keep this moving.

Mr. Allen and Mr. Keeney, if I can begin with you. You both made clear that in order for many States to meet the deadlines in the Clean Air Act, they are going to be required to adopt measures that go beyond those mandated in the law. Both of you have said that implementing California's low emission vehicle program will be critical for many areas of the country. For other areas opting into the Federal Reformulated Gasoline Program, even if they are not required to be a part of that program, it will be important.

Both of you emphasize that EPA should be doing everything to help States adopt these measures. I wonder if you could be a little

bit more specific and indicate what you think specifically EPA should be doing to assist the States in these areas?

Mr. KEENEY. With regard to LEV, since early last year, EPA has characterized their position on LEV as being neutral. However, as I mentioned in my testimony, the States and the OTC are faced with the challenge of meeting the ozone nonattainment requirements of the Act, including the 3 percent annual emission reduction requirement. It's difficult to see how these requirements can be met without LEV. Ultimately, under the Act, it's EPA's responsibility to help the States meet the Act's requirements and provide some support to the States as they attempt to adopt and implement the reasonable measures.

We believe that neutrality on a measure like LEV is inconsistent with these responsibilities. This cooperative approach will also be especially important if the OTC ultimately decides to start consideration of LEV under the recommendation process laid out in Section 184(c) of the Clean Air Act.

Given the fact that this authority has never been used before, procedural aspects of this section need to be carefully considered and EPA can be helpful here. The chairman of the committee, Scott Weiner, wrote to Administrator Browner last week regarding this and we're hopeful that the spirit of the cross-border sales decision, which she previously issued, will extend to consideration of the LEV Program as well.

Also, we believe that it will be valuable if EPA could rank the effectiveness of alternative measures, alternative strategies that are out there. For instance, give us a menu of measures that States could use to meet their reduction requirements. That would be very helpful.

Senator LIEBERMAN. That's a helpful answer.

Mr. Allen?

Mr. ALLEN. I'd like to talk a little bit about reform and it would seem to me one of the first things that could happen is EPA could revert back to the agreement of their regulatory negotiation of a couple of years ago and that would provide some certainty.

The second thing that could be done is they could begin to talk to States which might want to opt in and explain to them the merits of opting in and how to opt in, those kinds of things, a little bit of public outreach.

The third thing I think is they could begin to provide some discussions with the refineries that produce the reformed gasoline to make sure it's available on time.

Senator LIEBERMAN. Thank you. Those again are helpful and specific responses.

Ms. Hartsock, continuing with what EPA can do to make this process work better, I was interested in your testimony and the suggestion that EPA seems sometimes to focus too much on the details of the procedures rather than on the end result of decreasing air pollution. I wonder if you could give us maybe an example of that and then any specific recommendations you'd have for improving the situation?

Ms. HARTSOCK. It's very difficult to come up with suggestions for improving it but let me start by giving you an example of what I'm talking about. When I pulled together this testimony, I thought to

myself I'd better have an example if I'm going to say there's too many details. Right before I got on the airplane, I asked the staff to look through and see what kind of guidance we had gotten on Title I because that was the issue before us today and to give me a page count on the number of pages of guidance that we had received so far.

We only had about a half hour to work on the project so perhaps they missed some things, but there were over 2600 pages of guidance that they were able to identify right off.

Senator LIEBERMAN. In that one area?

Ms. HARTSOCK. That's dealing with Title I, the stationary and the mobile source control programs.

Senator LIEBERMAN. A big area but still a lot of pages.

Ms. HARTSOCK. In many ways, establishing a relationship as complicated as what we have in the Federal Clean Air Act to achieve the goals of attainment for all of our areas is going to require a lot to be written down, so that the parties can reach agreement and can have programs that are consistent nationally. However, for everything to be written down on a Federal level and then implemented merely on a State level is probably not going to be possible. We're going to have to establish certain areas where the States have discretion to design their own programs and to carry out those programs and so long as the programs are effective, to allow those States to do their own development work.

Senator LIEBERMAN. Go ahead, Senator Baucus. I'll do another round.

Senator BAUCUS. As I recall, some of your statements gave EPA a fairly low grade. It ranged from A minus to D minus but most of it in the D range. How do States rate themselves in living up to their responsibilities?

Mr. ALLEN. I think on balance most of the States would probably come in at a B or B plus based upon the fact that we've done everything possible and in many instances, we have to go beyond the Federal requirements to either demonstrate our 15 percent plan.

Senator BAUCUS. Is there anyone who disagrees with B to B plus as a grade for States?

[No response.]

Senator BAUCUS. How would States rate the Congress?

Mr. ALLEN. I think we'd have to go pretty high on that one, Senator.

[Laughter.]

Mr. ALLEN. I think the way the Clean Air Act was laid out in terms of the progressive steps showed a lot of foresight and the fact that it was forward looking and demanded changes in technology and allowed for modification as we moved through the process.

Senator BAUCUS. So overall, what grade on the Act?

Mr. ALLEN. B.

Dr. WALLERSTEIN. I would say A minus and I would say A minus only because the Act is so complex and has so many provisions to it and is so important in terms of the health of the residents of our region and elsewhere in the country that it's probably nearly impossible to do a perfect job on something as big and complex as that.

Senator BAUCUS. Anyone else?

Mr. ALLEN. I'd like to go back to EPA's grades for a minute. It's my view that EPA has worked very hard with the State and local agencies to develop good air pollution control programs. Some of their grades that we provided are affected by factors over which they had no control as in the areas of public outreach, education and working together on the technical level.

Senator BAUCUS. How would you grade EPA on matters over which they do have control?

Mr. ALLEN. I would think their grades would come up a bit above the D area, maybe to C or C plus.

Mr. KEENEY. I'd like to add to that with regards to the Ozone Transport Commission's experience. We believe there certainly have been some bright spots with EPA. Through their provision of financial support and then their modeling assistance as well as technical assistance has been quite good.

Senator BAUCUS. What's the reason for these delays, just bottom line? What does this all boil down to?

Mr. ALLEN. There is an awful lot of technical detail to wade through; there's a big education curve; and there's a lot of work to do, as well as the numbers of regulations that are required are really astronomical.

Senator BAUCUS. Maybe that's Congress' fault, maybe it is too complex. Either it's slightly too complex, which could be slightly simplified, in which case, EPA cannot be blamed, at least about the complexity of the Act unless EPA itself is implementing it in a more complex way than need be. Any reactions?

Ms. HARTSOCK. One thing we shouldn't overlook here is that the problems we're attempting to solve are very complex problems, thus the statute and the work toward solving those becomes very difficult.

Ozone, one of the pollutants we've spent a lot of time talking about here, isn't even directly emitted into the area, it's formed. It's a giant chemical reaction out there occurring throughout our major urban areas. The emissions come from millions and millions of points, so it is very complex both to establish a statute that would instigate the programs necessary to remediate the problem and also implementing those programs.

Senator BAUCUS. Why are some States doing a better job meeting the November 15th VOC 3 percent compared to others?

Mr. ALLEN. In some cases, they have less to do than other States.

Senator BAUCUS. Let's take States with the same category, whether it's moderate, severe or what, are States in the same categories doing better significantly than other States?

Mr. ALLEN. It would seem to me that States in the same category are facing generally the same problems and that is looking for the additional reductions they can apply to the 15 percent. The detail and the regulations they have to craft are more involved.

Senator BAUCUS. So in each of the categories, the States are doing about as well as other States in that same category, is that correct?

Mr. KEENEY. In a State like Connecticut, the entire State is either severe or serious. We have the most incentive to come up with the most aggressive program available, so we've been working extra hard to do that.

Senator BAUCUS. If you were the EPA Administrator, what would you do to straighten out the problems, as the States see them, with respect to implementation of the Act?

Dr. WALLERSTEIN. From the Los Angeles perspective, the most important action would be to ask the Office of Mobile Sources to move expeditiously and aggressively for sources that are solely within the Federal jurisdiction.

Senator BAUCUS. You mentioned that earlier. Any other response?

In addition to California's problems, what about other States?

Mr. ALLEN. I would think that the Air Office itself could use some more resources in terms of money and contractor support to answer some of the complicated questions and provide the detailed guidance the States need.

Senator BAUCUS. As Administrator, you'd just provide more money.

Mr. ALLEN. And to OAQPS as well.

Senator BAUCUS. OK. The red light is on.

Senator LIEBERMAN. In the report that the GAO released in June on title I and implementation oversight, they suggested that one response to the delays that we're talking about on EPA's part would be for EPA to delegate more authority to the regional level of EPA. I wonder what you think about that? Ms. Garber, do you want to get in on that one?

Ms. GARBER. I think that one of the things EPA could do is to work with the States to set priorities and in that sense, the priorities might vary from region to region in terms of which rules might be the more critical ones. I do think there are certain issues that need to be addressed on a national basis so that delegating authority to the regions might not be the appropriate response.

Senator LIEBERMAN. Any other responses to giving the regions more authority, to review submittals particularly?

Mr. ALLEN. I think if the regions had appropriate guidance, they probably could do a much better job at reviewing submittals and a lot of the submittals could be approved at the regional level.

Senator LIEBERMAN. Let me come back to the Ozone Transport Commission because I spent a lot of time working on that and I appreciate the support of my colleagues because of its obvious importance for Connecticut.

As we've said, the entire State pretty much violates the health-based standard for ozone and a lot of the reason for that is because of pollutants blowing in. Therefore, I'm very pleased to hear the positive report Commissioner Keeney that you've given.

Are there lessons that we can learn from the Ozone Transport Commission experience so far about how to approach other interstate pollution issues?

Mr. KEENEY. I think there are three reasons why the Commission has been as successful as it has. First is it's commitment to consensus building. When we first organized the Commission in mid-1991, we structured our bylaws to reflect our commitment to creating broad support for our formal actions and believe that we have been successful in that regard.

Second, part of the reason that we've been able to build consensus on key issues over the last two years has been that we've had

well-defined goals. As you know, the Act's ozone SIP provisions are straight forward and the States of the Commission are therefore raising very similar requirements. We realize basically that we're all in the same boat.

Finally, I think the Commission, with its direct representative of Governors, and in the case of the District of Columbia the Mayor, plus the air pollution control directors from each jurisdiction, has also served the Commission well. It gives us the members who can provide perspectives from both the executive level and the technical level to deal with regional air pollution problems and that mix of perspectives has been very effective in providing reasonable approaches to the challenges we face.

Senator LIEBERMAN. None of the concerns that were expressed early on when this idea was first approached about what might be called sovereignty, State control of its own situation and fear of a suprastate authority, hasn't materialized?

Mr. ALLEN. I think obviously whenever you have a larger governmental organization and also the EPA as well, it could infringe upon a State's right to choose whatever it wants to do with regards to the Clean Air. I think there is the potential for friction there. Because of the fact that everyone acknowledges the transportability of ozone and those States in particular that have the ozone problems realize that a regional perspective is absolutely necessary and therefore are willing to give up some of that individual attention that they otherwise might have. Again, States like Vermont, I think get special considerations because Vermont is a State that's in attainment but because of their inclusion in the ozone transport region, have certain requirements they must meet that normally they might not be meeting. So there are special situations that are different.

Senator LIEBERMAN. How are they handling that? What's their response been thus far?

Mr. KEENEY. They work very well with the region, with the Commission itself, but I know they are considering possibly excluding parts of their State, if not the entire State, from the region because of their attainment status.

Senator LIEBERMAN. Let me switch for a minute to a different kind of question. In the surface transportation legislation, which also came out of this committee, we were very aware of the need to provide States with some financial assistance to help them implement transportation projects that would help attain clean air goals. I'm curious, generally speaking, about how you think those funds are being spent at this point. Are they helping?

Mr. ALLEN. I think in some areas they are helping and in other areas, there is still some tension between the old transportation ideas and the air pollution control needs. So I think it's a function of locality and relationships.

Mr. KEENEY. In Connecticut, I know that the ice tea funds have been tremendously helpful with regards to planning for bikeways, for greenways. One of the ironies is that from the standpoint of the transportation folks, a few million dollars is relatively a small amount of money. To the rest of us, it's huge.

Senator LIEBERMAN. I'd like to make one more point about transportation. I think the link that transportation has to a regional air

pollution control strategy is just now being understood in the northeast corridor and other major metropolitan areas which span multiple States. I think we need to look at connecting the transportation link with the air pollution control link.

Senator LIEBERMAN. Dr. Wallerstein?

Dr. WALLERSTEIN. I was just going to say that in southern California, it's also been very valuable in the implementation of transportation control measures, clean fuels, and we've also seen the use of the ice tea funds for controlling particulate matter in the Cochilla Valley area near Palm Springs where one of the key problems is resuspension of dust from motor vehicle use.

Senator LIEBERMAN. Senator Baucus.

Senator BAUCUS. What could be done to help bridge better cooperation between the transportation industry and States in implementing the Act. First of all, I'd like your assessment of that relationship and second, where there is tension, your solutions?

Mr. ALLEN. I think one of the very obvious solutions would be for concurrence between the air pollution control agencies and the transportation people in their TIPs in their conformity determinations.

Senator BAUCUS. Under the law, does DOT have only an advisory role?

Mr. ALLEN. DOT, to my understanding of it, has a primary role with the conformity issues now becoming one where the air agencies are looking for concurrence.

Senator BAUCUS. Does everybody agree somehow we've got to forge the two together?

Mr. ALLEN. Yes.

Senator BAUCUS. What about development of environmental technology. I was struck, when I was at the Rio Summit a year ago last June, with two points. One, was just how the world has changed in the post-Cold War era, but second, with the opportunity to develop environmental technology worldwide.

At a big demonstration out in Sao Paolo, the Japanese and the Germans had a plethora of environmental technologies they were demonstrating. We Americans had virtually nothing.

The basic question I have is what advice do you have for encouraging incentives for the development of more innovative and creative environmental technologies whether it's remedial, preventive, or environmental process technologies to help this country be much more efficient, which obviously improves the bottom line of companies. This, in turn, creates better environmental protection, provides jobs in developmental technologies, and helps address the trade deficit we have worldwide? There is an opportunity in these oversight hearings to focus on all of that and we have heard that when the EPA sets specific performance or technology-based standards, it locks in technologies and prevents development of new, more creative technologies, as in the development of the CTGs, for example, that Ms. Garber mentioned.

I'd like you to sit back a second and just tell us how we, in the Congress, and EPA, can encourage more creative, more efficient environmental technologies with respect to air?

Mr. ALLEN. I think one of the areas Commissioner Keeney has already talked about would be to actively support the lab program,

look at the reformulated gas issue, and market-based incentives I think is a real good opportunity.

Mr. KEENEY. We can encourage programs like the emission credit trading program whereby Stats and companies are encouraged to over control and because of those over controls, they can build up economic credits that they can bank and sell. Therefore, they can take advantage of the technology that's out there where possible go beyond what controls require; do so and receive an economic benefit for it.

Also, with regard to environmental industries, I think there is tremendous opportunity out there and as you say, the Japanese and the Germans are well ahead of us; but I think there are great opportunities through defense diversification, through the provision of possibly grants or loans or maybe even tax incentives, particularly for small businesses to pursue the opportunities that are out there for environmental industries.

Senator BAUCUS. Someone said to me that most NO_x scrubbers are not American, they are German because Germany has higher stationary source standards and stationary source standards then do we. Is that accurate?

Mr. KEENEY. We have a company in Connecticut called Nalco which is located in Stanford, Connecticut that has been producing NO_x scrubbers for 10 years and the reason they have is because Connecticut has been requiring those scrubbers for over 10 years. It's the only State in the northeast that has——

Senator BAUCUS. Am I accurate in saying most of the large stationary source scrubbers are not American but are foreign technology? Is that accurate or not, do we know?

Ms. HARTSOCK. I don't have the data here. I'm sure we could check on that for you and see if we can get some statistics.

Senator BAUCUS. We've got to find ways to be more creative here, more incentives.

Dr. WALLERSTEIN. We've found in southern California in terms of environmental technologies that a combination of technology forcing standards and market incentives such as temporary credits for surplus emission reductions or early emission reductions works very successfully.

We have a $7 million per year technology development program at our agency funded through an extra charge on vehicle registrations and we've found that by fostering the development of technologies in a joint manner with other agencies and the private sector, we have been able to leverage our investment over the years at $3 to every one that we put into it.

Senator LIEBERMAN. Did you have a response to that?

Ms. GARBER. I think the issue, in addition to being innovative, is to actually use the innovations that occur and that in part that takes a lot of educational effort. I think many industries are very conservative and that even though a very innovative technology night be out there, there needs to be some incentive to get them to use it.

Senator BAUCUS. That's a very good point. In fact, this committee introduced a bill, as did Senator Lieberman, Senator Mikulski, Senator Chafee, and others, and the environmental technology bill reported out of this committee last week addresses a lot of these

points, including yours. One title of it includes demonstration technologies and using a certain percentage of say the clean-up funds, Superfund and the other clean-up funds we have to apply new technologies and to demonstrate these new technologies and also a clearinghouse for these new technologies so that people know more about them, and also encourage much more flexibility between EPA and companies or States it may be dealing with.

The question of sanctions in the Act. Are they too severe, would you modify them?

Mr. ALLEN. I think the sanctions, given the 18-month lead time or sanction period itself, is a fairly reasonable approach to the timing problems that some States have.

Senator BAUCUS. What do we do when some State says that's to cataclysmic, we didn't do it, we didn't meet this deadline and is banking on Congress to delay, what advice do you have to prevent that relaxation from occurring?

Mr. ALLEN. My suggestion would be to implement the Act the way its written. It's scoped out very well, the sanctions provide the incentive they need to keep people on the track.

Senator BAUCUS. So we should just say to the governors tough?

Mr. KEENEY. Just reinforce the sanctions that are there. I think they are very effective in getting the attention of the proper officials in the State.

Senator BAUCUS. What sanctions do we come up with to get EPA to be on time?

Mr. ALLEN. I think oversight hearings like this.

Senator BAUCUS. This is talk, but we can also act. What actions can we come up with?

Mr. ALLEN. Some of the things I think we discussed already, delegate more of the responsibility that is truly delegated to the regions, provide a little more resources and lead time for them to develop their guidance and technology for the States and convince them that they can release more to the States and empower the States more and act as an audit and oversight agency, and get away from the nit picking. I think that's a cultural change.

Senator BAUCUS. Maybe we ought to use the new building as an incentive.

Thank you, Mr. Chairman.

Senator LIEBERMAN. Thank you, Senator Baucus.

Dr. Wallerstein, time doesn't allow me because I need to move on to the next panel, but I admire the emissions trading system that you're beginning to implement. I'd appreciate it if you would submit a longer statement on it to the committee as progress goes along.

Commissioner Keeney, I want to congratulate you on getting in that reference to the scrubber manufacturer in Stanford.

Mr. KEENEY. Thank you.

[Laughter.]

Senator LIEBERMAN. Thank you. You've been a very forthright and helpful panel. We look forward to continuing to work with you. Thanks for coming from all around the country.

Let's go to the second panel which is Professor James Ware, Dean of Academic Affairs at Harvard School of Public Health; Dr. Rebecca Bascom, Professor of Medicine, University of Maryland on

behalf of the American Lung Association; and Mr. Rob Brenner, Acting Deputy Assistant Administrator, Office of Air and Radiation, EPA, accompanied by John Sykes, Director of Air Quality Standards. Thank you all for being here.

Professor Ware, we'd like to begin with your testimony.

STATEMENT OF JAMES WARE, DEAN OF ACADEMIC AFFAIRS, HARVARD SCHOOL OF PUBLIC HEALTH, HARVARD UNIVERSITY

Mr. WARE. Thank you, Senator Lieberman, Senator Baucus, and staff. I appreciate the chance to be here today and to talk with you. I will be brief.

I am a professor of biostatistics at the Harvard School of Public Health. I've been there for about 15 years. My principal research interest during that time has been in the health effects of air pollutants. I have been involved in many of the studies that have been considered influential by the Environmental Protection Agency in setting standards for particulate matter.

I served on the Clean Air Science Advisory Committee from 1984 to 1987, so I had a chance to see the regulatory or at least the participation of the scientific community in the regulatory side of setting air quality standards.

I'm here today representing my colleagues at the Harvard School of Public Health, especially Doug Dockery and Professor Arden Pope who has been with us this year and who have authored many of the papers that I'll be discussing. My role is to summarize what I consider to be a very important body of emerging research on the health effects of particulate air pollution and discuss briefly with you its implications for risk assessment.

It's been known for many years that particulate air pollution is a potential source of adverse health effects. As recently as my term on the Clean Air Science Advisory Committee, there was a feeling that much of the evidence really had implications primarily for exposures far above those we see today. People talked about the high levels of exposure in London, Pittsburgh, and other manufacturing areas during the 1950's and felt reasonably optimistic that current levels of particulate air pollution didn't have appreciable health effects.

In the last review of the criteria document for particulate matter, there was a very sparse body of epidemiological literature available to help us think about this question. Dr. Joel Schwartz, who is an EPA employee and a colleague took another look at the London mortality data and came away with the impression that the association between air quality and daily mortality rates could be seen down to quite low levels of air pollution.

So we came out of that work wondering whether there might be some effects of air pollution exposures at the levels that we're seeing today. That work stimulated quite a few studies, a remarkable body of work that has been completed primarily in the last 5 years.

One series of studies has reported associations between particulate air pollution concentrations and daily mortality rates in communities across the United States. I provide a table in my written comments summarizing the 10 or so studies that have shown an as-

sociation between day-to-day changes in air quality and day-to-day changes in the mortality rates in a wide range of communities.

There has been some related evidence, particularly the studies that have looked at the respiratory mortality rate, which have shown that the effects on respiratory mortality are greater than those for total mortality as you would anticipate if it was a causal relationship.

The strength of the association for total mortality is that a change of 10 micrograms per cubic meter in daily pm 10 concentration is associated with about a 1 percent change in mortality rate. For respiratory mortality, it appears that changes of 2 to 8 percent are associated with a 10 microgram per cubic meter change in pm 10.

I will not try to review the scientific debate about those studies, I'll simply summarize it by saying that, in my opinion, those studies do not provide a plausible alternative to a causal effect of exposure to air pollution for those relationships. People have examined epidemics, they've examined weather patterns, humidity, and a variety of other factors to try to identify some exploration for these relationships other than air pollution. I think the epidemiologists feel that there is no plausible candidate other than air pollution.

That doesn't mean that the relationship has been demonstrated to be a causal one but from an epidemiologic point of view, we're running out of other ideas. So that's my sense of the mortality data.

Going to some of the related information, at the same time that we've seen these relationships with mortality rates, we've also seen studies showing associations between air quality and hospital admissions and emergency room visits, particularly for respiratory disease, chronic obstructive pulmonary disease, and asthma. So again, if we think this is a causal effect of air pollution, we would expect the kind of findings that we see in terms of hospital and medical care utilization. There have been increases of about 1 percent per 10 micrograms per cubic meter in hospital admission rates for respiratory reasons and in emergency room visits.

There also is a growing body of related evidence touching on the spectrum of respiratory end points. People are finding declines in pulmonary function levels, small but measurable, during periods of elevated particulate air pollution; increased rates of respiratory symptoms; individuals with asthma are more likely to experience adverse effects and to use bronchodilators during those episodes. So there is quite an impressive body of literature that I summarize in greater detail in my written comments.

Some pulmonary physicians express caution about these epidemiologic findings and point out that they've not been supported by toxicologic studies. That's true, there's a lot that's not understood about this relationship. For one thing, particulates are a very complicated collection of entities. They include the products of controlled combustion, fugitive dust, particularly in agricultural areas, and we need to know more about the composition of particles and the source of these adverse health effects if indeed they are causal.

Moreover, there is the need to understand more about the physiology and the molecular effects of particles so that people can

begin to sharpen our understanding of why these effects are occurring. I'll say why I think that is important in a moment.

The Environmental Protection Agency is soon going to be faced again with the challenge of evaluating the evidence regarding the adverse health effects of particulate air pollution. Indeed work on a revised criteria document may begin as early as this calendar year.

The new research that I've been describing to you does not suggest any threshold for this relationship. The apparent association between particulate air pollution and these respiratory effects appears to be seen across a very wide range of concentrations found routinely in urban and semiurban areas in the United States. So this will make it difficult if not impossible to establish a standard which adequately protects human health with a sufficient margin of safety and which is supported scientifically by this body of epidemiological evidence.

In my view, given the strength of the epidemiologic data, our best hope for clarifying the scientific situation and for obtaining some guidance about the implications of these studies for human health is going to lie in chamber studies, in animal studies, in toxicologic work, and in environmental characterization of these pollutants so that the EPA can begin to sharpen its focus and its regulatory strategy. Otherwise, we're going to be faced with a very strong imperative from the epidemiologic literature and potentially enormous implications for human activity to address the levels of particles that are generated by human activities that are both widespread and routine.

Thank you.

Senator LIEBERMAN. Thank you, Professor Ware. That's powerful testimony and provocative. It's very chilling.

Dr. Bascom, we welcome you on behalf of the American Lung Association.

STATEMENT OF REBECCA BASCOM, M.D., PROFESSOR OF MEDICINE, UNIVERSITY OF MARYLAND, ON BEHALF OF THE AMERICAN LUNG ASSOCIATION

Dr. BASCOM. Thank you.

Senator Lieberman, Senator Baucus, and members of the subcommittee, I'm Dr. Bascom, Associate Professor of Medicine at the University of Maryland's School of Medicine and direct its Environmental Research Facility.

Maryland is a State where 90 percent of its citizens live in areas that violate the ambient air quality standard. So I'm sorry to say we're close behind Connecticut in that regard.

Today, I am presenting comments on behalf of the American Lung Association. I also appear as a doctor who has patients who suffer from lung disease and as a mother of two small children who very much wants to raise healthy children in Maryland.

My purpose today is to present recent health research on the health effects of ozone air pollution. Based on this information, the American Lung Association places a very high priority on preserving and strengthening the Federal Government's Ozone Air Pollution Control Program.

What are the health effects of ozone and what has changed in our understanding compared to 1979 when the ozone standard was raised from 0.08 to 0.12 ppm?

One, we know that respiratory symptoms and decreased lung function occur with exposure to ambient levels. Studies of healthy children and adults show increases in respiratory symptoms and decreases in lung function with exposure to ozone at and below the 0.12 ppm level.

For example, in one clinical study using a 6 hour exposure to 0.12 ppm, an average decrease in lung function of 13 percent occurred, and the most sensitive person in the study had a nearly 50 percent decrease in lung function.

Two, deep lung inflammation and cell damage occur. Exposure to ozone at levels as low as 0.08 ppm, for 6 hours with exercise, show clear signs of cell damage, leakage of blood vessels, and influx of white blood cells. This is like a sunburn deep in the lung. In fact, investigators who looked at the bronchial tubes directly after ozone exposure saw them to be red and inflamed.

This cumulative effect of ozone is of particular concern because the eastern United States has broad ozone peaks of between 0.08 and 0.12 ppm for 6 to 8 hours at a time frequently in the summer.

Three, ozone air pollution lands people with asthma in the hospital. A recent group of epidemiologic studies have been published looking at patients from Ontario, New York, New Jersey and most recently, Atlanta. These studies show a link between increased hospitalization rates and one hour average levels of ozone below the current standard. Ozone is not simply a problem with the healthy, exercising person who overexerts outdoors on a hot, summer day.

Why is this happening to people with asthma? Probably because the decreased lung function and lung inflammation are occurring in people whose health is already compromised. Also, ozone may make people more sensitive to their allergies. A 1991 study showed that only one hour exposure to ozone at 0.12 ppm at rest made people with asthma twice as sensitive to their pollen allergy. Since asthma is a widespread and costly disease, these findings have important public health implications.

Finally we know that ozone causes chronic changes in lung structure and function. Animal toxicology studies show that chronic exposure to ambient ozone levels result in local changes in cells in the upper respiratory system and in cells at the junction of the airway and the alveoli, the air sacs where gas exchange occurs.

Further, Austrian children have been shown to have prolonged increases in bronchial hyperresponsiveness and in studies from southern California, accelerated loss of lung function has been shown. This information adds to mounting evidence of long-term health effects that an accelerated research program is clearly needed in this important area.

In summary, between 1979 and 1993, major research advances have occurred casting significant doubt on the adequacy of the current ozone standard to protect human health. In the opinion of the American Lung Association, the current national ambient air quality standard for ozone does not represent prudent public health policy or the mandates of the Clean Air Act. The American Lung Association is particularly concerned that EPA staff has suggested

recently that the schedule for completion of the current review process will extend well into 1997. This schedule does not represent, in our opinion, a timely response to the pressing need of developing an adequate standard for ozone. We hope that the EPA can do better than that, of course with your encouragement and support.

Thank you.

Senator LIEBERMAN. Thank you, Dr. Bascom, a perfect lead-in to Mr. Brenner on behalf of EPA.

STATEMENT OF ROB BRENNER, ACTING DEPUTY ASSISTANT ADMINISTRATOR, OFFICE OF AIR AND RADIATION, EPA

Mr. BRENNER. Thank you, Senator.

I'm Rob Brenner and for the last 5 years, I've directed EPA's Air Policy Office. Currently, I am the Acting Deputy Assistant Administrator for the Office of Air and Radiation. As you mentioned earlier, I'm accompanied here by John Scite who is the Director of our Office of Air Quality Planning and Standards.

What I wanted to do was begin my testimony by trying to place the concerns you heard in panel one in perspective. I'm a part of what I feel is a team at EPA working to implement the Clean Air Act. I say team because it really is a combination of attorneys, scientists, economists, policy analysts, and engineers who are all working together to try and bring to fruition the promise of the Clean Air Act.

You have met many of them. We worked with you, both of you, several years ago in trying to develop the new Act, which is landmark legislation that will enable us to reduce air pollution by 56 billion pounds per year when it is fully implemented. I'm proud to say that by working not only days, but nights and weekends, this staff—this team—has been able to produce 144 rulemaking actions in just the 2½ years since the Act was passed. That's 89 proposed rulemaking and 59 final actions. Those rules address over 85 percent of those 56 billion pounds of reduction.

Even more importantly than rulemakings are the air quality results that we are seeing. For example, when you look at the 1992 monitoring data for carbon monoxide, at the 42 areas that were not meeting the standards when the Act was passed, 40 of them are new monitoring attainment. That doesn't mean that they have met the standard yet. They will have to keep that up for another year or so and we'll have to make sure they have maintenance plans, but if you look at the monitored data, 40 of them are currently meeting the standard out of 42.

In the case of ozone, out of the 96 areas that were not meeting the standard when the Act was passed, almost half of them, over 40, are now monitoring attainment. Again, they will need to keep it up before we can deem them to be in attainment with the standard.

So I'd ask that, although we have not achieved all that we hoped to in the first 2½ years since passage of the Act, and there is a lot more left to do, that we take into account that this kind of progress implementing any major piece of legislation, is unprecedented. I

think we've made a very strong effort in kicking off the new Clean Air Act.

Not only that, these impressive results have been achieved in very innovative ways. I believe we are at the forefront of consensus building efforts, use of economic incentives, and in developing partnerships with the States. For instance, we have done things like developing a general preamble for implementing these air quality title of the Act. This action was not required by the statute but we felt we should give the States overall guidance on how to implement title I. Now we are working with them as you heard earlier to develop model documents for how States can go about developing the 15 percent progress plans that are going to be so challenging for them.

They have participated in our work groups and in our advisory committees in developing our rules. We hold over 800 meetings a year with State officials and that doesn't even count the conferences and seminars that we also sponsor. We've provided training for 3,000 State and local officials yearly. We've set up a low cost satellite downlink system with over 500 hours of programming a year. We've created computer networks that link EPA, State and local officials. We've provided technical assistance to States through clearinghouses, hotlines, newsletters, electronic bulletin boards. We do that because we know States will need our help in order to be successful—particularly especially as they try to work with the their State legislatures to obtain the authority they need to implement their programs.

We are also aware that we need States' help. We need their help to advise us on our rulemakings; we need them to develop effective permitting programs and effective State implementation plans.

Unfortunately, as I said, we have produced less than intended in some areas. In some cases, we've been hurt by a lack of resources, a problem that's felt all across government these days. We have had some cases where areas have been determined to test our resolve to implement the Clean Air Act and we've had to work to overcome that. In other cases, we've been hurt by what's now known as government gridlock.

I have been heartened by the attitude of the new Administration toward all of these problems. There is a real commitment and concern regarding providing us with resources we need to implement the Clean Air Act. When there have been areas that seem determined to test our resolve on implementing the Act, the administration has followed through with letters and statements saying that they intend to use sanctions when necessary to prod recalcitrant areas to develop their plans, with respect to government gridlock, the kind of working relationships we have now with other agencies like the Department of Transportation—where Carol Browner and Secretary Pēna will be meeting tomorrow to try and figure out how best to proceed on conformity rulemaking—and the kind of relationship we've developed with the Office of Management and Budget which has far improved from where we were in the past Administration, demonstration that a new era has begun.

Next, I will very briefly discuss the 185(b) study which you asked me to comment on. This study will help guide our efforts to meet the ozone ambient air quality standards nationwide.

The 185(b) report is based on the National Academy of Sciences ozone study and our response to it. It is part of what I view as a key under planning of the Clean Air Act amendments: We should rely on sound science—not only to develop and design programs, but also during their implementation, to ensure that they are responsive to the current understanding of the science.

The 185(b) study is going to help us fine tune our efforts in meeting the ozone standard. For example, as a result of this study which looked at the formation of ozone and possible ways to control the formation of ozone, I believe States are going to decide to emphasize NO_x reductions more than they might have otherwise. I think there is more appreciation of the site-specific nature of ozone planning. I think we will see more public-private partnerships to enhance monitoring because there is a better understanding of how important monitoring is to developing cost effective ozone plans. For the same reasons, there will be better inventories and more extensive use of models. The result overall will be speedier attainment at less cost.

Finally, turning to the ozone ambient air quality standard: in March, we were faced with a very difficult decision. We were faced with a very tight court dead line requiring us to make a decision on whether to revise the ozone ambient standard. Close to 1,000 new scientific studies involving ozone had been completed since we finished our last criteria document reviewing studies that would lead to a revision of the standard. We just did not have time to evaluate all those studies, to do the kind of review that's necessary before we had to meet that deadline. We decided at that point not to revise the standard but to begin an expedited effort to, re-evaluate the standard and make revisions if necessary.

Those more recent studies are of great concern to us. As you heard earlier, they do demonstrate some very serious concerns regarding health effects of ozone including at the current levels for which the standard is set.

In order to revise the standard, it requires a scientific review and a regulatory development phase taking into account the results of that scientific review. We must meet all of the requirements of the Administrative Procedures Act. And it requires an implementation assessment if we're considering seriously changing the standard. It does little good to have a new standard if we haven't thought through carefully the implementation issues to ensure that it's a standard that actually can be met and that will result in air quality improvement.

The new EPA Administrator, Carol Browner, has directed us to parallel process these three phases and to complete our review of the standard by mid-1997. I know that seems to be a long time, but it's very important that these standards be based on sound science and that they have widespread support. These standards require much of the public and the economy. As a result of the 1977 Amendments, just we are spending close to $7 billion a year to meet the ozone standard. These new Clean Air Act amendments are going to add an additional $10 billion a year to that. If we go further, the cost will increase and the potential lifestyle and other concerns will be there. It's very important that before proceeding down those paths that we have carefully reviewed the standard

and we can say with certainty that we have widespread scientific support for how we're moving ahead.

Again, just as with the 185(b) report, we will not allow progress to stop while those studies are being reviewed. That is the last point I want to make. Whether or not the standard is revised, we are going to continue making progress on reducing VOCs, the hydrocarbons that contribute to the formation of ozones and NO_x. We have implemented gasoline volatility reductions to provide over a million tons of hydrocarbon reductions; we have put the standards in place to reduce tailpipe emissions from vehicles by 40 percent; we have an enhanced inspection and maintenance program which will require 2.8 million tons per year of hydrocarbon reductions. I could go through a list of additional measures that we're taking to reduce high VOCs on and NO_x (where we're getting a 60 percent reduction in tailpipe emissions). We've put in place NO_x standards for heavy duty diesel engines, trucks and buses. We have a utility acid rain requirement that will reduce NO_x emissions by a couple of million tons.

All of these are making dramatic reductions in the emissions that lead to the formation of ozone and not just in nonattainment areas. Remember many of these vehicle standards, most of them, will apply to vehicles across the country and will reduce the formation of ozone in these other areas of the country not just in the nonattainment areas.

Again, I want to express EPA's concern over the health studies, our commitment to do an expedited review of them, and, if necessary, to revise the standard. I also want to commit, that in the interim, we're going to continue to reduce the emissions that form ozone.

Thank you.

Senator LIEBERMAN. Thank you, Mr. Brenner.

Dr. Bascom, let's join the issue on the ozone standard and the concern that you've expressed on behalf of the Lung Association with the time frame of waiting until 1997. Why don't you describe that concern and explain why you think EPA can shorten it?

Dr. BASCOM. From the scientific viewpoint, as Mr. Brenner alluded to, there have been 1,000 studies already completed, so it's not a matter of needing to accumulate the science. I think the American Lung Association's impatience in part reflects from a decade of inaction on this matter and the concern that peoples' health is currently being adversely affected. We need to have a plan of action and long-range thinking based on a recognition of the scope and nature of the problem.

Senator LIEBERMAN. So you would say that the science is really already there and well-established?

Dr. BASCOM. Yes, there is an extensive body of published, scientific literature.

Senator LIEBERMAN. So what would you want EPA to do now in this particular area?

Dr. BASCOM. I must tell you I am a physician, scientist and researcher; the intricacies of moving things through the EPA is not something I'm expert in.

Senator LIEBERMAN. So it's easier to understand nature than the EPA?

[Laughter.]

Senator LIEBERMAN. I understand what you're saying. I think you've made your point.

Dr. BASCOM. We'll put suggestions in writing to you.

Senator LIEBERMAN. I'd appreciate that. That would be helpful.

Mr. Brenner, you did respond to some of the criticisms of EPA in your prepared testimony which I appreciate. One of the recommendations in the GAO report was that EPA delegate more authority to its regions to review State submittals. How do you feel about that?

Mr. BRENNER. We think that's a very good suggestion. In fact, we've been moving to implement that. Just to give you a sense of the problem, before this Act was passed, we used to have on the order of 200 to 300 State implementation plans submitted to us per year. In the first couple of years of the new Act, we've had 2300 SIPs submitted to us. It's a very difficult front-end problem that we're dealing with.

One of the things we're trying to do is work with our regional offices to delegate more of the authority to them. For example, we are going to try to reduce headquarters review or eliminate headquarters review for all but 5 out of 19 categories of submissions of State plans that now normally come to headquarters. So we are in the process of doing what the GAO recommended.

Senator LIEBERMAN. Good.

Professor Ware, let me pursue some of the data that you presented. I know that in some of the material that I read in preparation for the hearing, there were estimates that particulate matter, PM_{10} may be causing as many as 50,000 premature deaths a year. Is that correct?

Mr. WARE. That is a widely cited figure that can be derived from these studies, that's correct.

Senator LIEBERMAN. For the record, if you would define premature deaths or early deaths as that term is used here?

Mr. WARE. I think by premature deaths, we mean simply relative to life expectancy.

Senator LIEBERMAN. In other words, a person dies earlier than would have been expected were it not for the particulate matter?

Mr. WARE. Right. Let me say also that I'm aware of a substantial set of additional studies that aren't yet in the public domain that will further solidify the epidemiologic story, that will look again at the question of differential mortality rates geographically around the country and their association with air quality levels. So, whereas the studies I've been talking about today are talking about day-to-day fluctuations in mortality rates, there is going to be a new round of studies looking at differences geographically and their association with air quality. So I think the epidemiologic evidence is going to continue to coalesce.

Senator LIEBERMAN. In your testimony, you've drawn an epidemiological conclusion that there is a cause and effect relationship here and you stated it quite clearly, between the particular matter as revealed in the data and the incidence of premature death or respiratory problems?

Mr. WARE. I don't think I'd want to leave the impression that I've gone quite that far because I think it's fair to say that real

confidence in the causality of this relationship will come from an understanding of what's going on the cells and at the molecular level in the body. I would say that, insofar as epidemiologic data can resolve this question, the evidence is becoming increasingly compelling and it leads to a situation where prudence would dictate, I think, that one act as if this is a causal relationship. Even though one could not argue that there's proof, there is a point at which it is no longer prudent to act otherwise.

Senator LIEBERMAN. That's my next question. In other words, the epidemiological data is conclusive. I suppose for the ultimate proof or conclusion, we'd have to await further biological studies. The question then is how do we alter the existing standard to reflect what the epidemiological data suggests or do we have to wait until we see the biological data?

Mr. WARE. I think right now, thinking back to my experience on CASAC, it would be a difficult question. If we want to protect human health with an adequate margin of safety and with no consideration of the economic impact of a standard, it is difficult to see a basis for a standard that's attainable in many urban areas in this country. If we look at studies in communities like Philadelphia, Birmingham, Detroit, we see an association between these health end points and air quality over the entire range. Even if you compare the second quintile to the first quintile, the cleanest quintile, even there you see a gradient. So it suggests that we ought to, at the minimum, bring air quality down to the lower end of the distribution in these communities and that would be a very challenging job.

Senator LIEBERMAN. How long do you think it will be before what I've referred to as the biological studies would be done to a sufficient extent that we could draw a conclusion?

Mr. WARE. At the moment, it's difficult to be optimistic about early resolution. That's a difficult question and there's a lot that's not understood. My own opinion—and Dr. Bascom, perhaps you'd like to comment—is that I don't see that happening in the near term.

Senator LIEBERMAN. In this case, near term means the next 5 years?

Mr. WARE. Yes. In the time frame of the next criteria document. There will certainly be some work but I don't anticipate feeling resolved about mechanisms and about the constituents of particles and what elements of the particulate mix are primarily involved in this relationship and that sort of thing.

Dr. BASCOM. I agree.

Senator LIEBERMAN. Mr. Brenner, how do you respond to this dialog? I know you spoke about it a bit in your testimony. These are very jarring statistics that Professor Ware has reported to us from a run of studies. What do we do in the meantime while we have this warning sign?

Mr. BRENNER. These statistics Professors Ware mentioned are of great concern to us. One of the primary researchers in this area is an EPA scientist, Dr. Schwartz, are well aware of these studies.

There are a couple of things that we feel we have to do in response. One is we have to make sure we begin public workshops and a scientific review of these studies and begin expediting the de-

velopment of a new standard for particulate matter, but as we've all noted, it's going to take some time to do that. In the meantime, the Act provides several ways by which we can reduce particulate emissions.

For example, no matter where the standard ends up, one of the most important things we could do is reduce sulfur dioxide emissions from powerplants because they are transformed into sulfates which form a lot of the fine particles that are of concern in these studies. As you well know, we have already begun a 10 million ton reduction program for sulfur dioxide from powerplants. We've put into place standards for diesel trucks and buses for woodstoves and for coke oven plants. We've put out guidances for prescribed burning and other kinds of agricultural practices that can produce particulate matter. It's very important that we continue to be aggressive in our efforts to implement the PM_{10} reduction measures that are currently in the statute. We want to continue to make progress in reducing particulate matter emissions while we move toward revising the standard which will, in effect, fine-tune our eventual goal.

Senator LIEBERMAN. Clearly, I'd like to continue to work with you on this.

Senator Baucus?

Senator BAUCUS. Mr. Brenner, I'm a little confused. Does the reduction of SO_x bear directly on PM_{10}?

Mr. BRENNER. Yes, Senator Baucus, it does. Sulfur dioxide, when it is emitted from powerplants is transformed in the atmosphere into fine particles called sulfates.

Senator BAUCUS. How far are we in our goal of reducing emissions by 10 million tons by roughly the year 2000? This is already 1993.

Mr. BRENNER. What the Act requires is that in 1995, the first 5 million tons of reduction take place and in the year 2000, the second 5 million.

Senator BAUCUS. What's your guess? Are we going to meet that goal by 1995?

Mr. BRENNER. Yes, we are. All of the regulations are in place, we have already seen utilities developing their compliance plans and submitting them to us. By the way, we have seen tremendous progress in the development of new technologies for accomplishing that.

Senator BAUCUS. Back to PM_{10}, Dr. Ware's suggested the biological data is going to take a while. I guess Dr. Bascom, you'd agree—you did agree, this can take a while. Does that mean that we should wait until we get the biological data?

Dr. BASCOM. I'd say that's a very tough call. I think the EPI studies are very concerning. As someone who does controlled human studies, I can say that our inability to do the biologic studies relates to trying to reproduce the complexity of the atmospheric environment in the chamber studies. So it isn't that we've done the complementary studies and they have been negative; it's that the technical problems of reproducing the atmosphere are substantial.

I think it is time for a cautious look at this problem. For example, the EPA could start the long range thinking: what are you going to do if this is borne out. These studies are very solid work

done by very reputable investigators with results showing health effects in a lot of places in our country. I think the long range planning has to start happening.

Mr. WARE. The other point I would make is that the effort to reduce concentrations of particulate pollution down to the levels that might be suggested by this work is going to be a very substantial social undertaking.

Senator BAUCUS. That's the next question. What are the consequences?

Mr. WARE. It is a very ambitious and daunting task for the country. A careful look at the science and reflection about how to move forward on this is going to be unavoidable. Even a very aggressive approach would come up against fundamental social and economic issues in this country.

Senator BAUCUS. That's the question. Mr. Brenner, what are the sources that would be impacted if we do move in this direction if they reduce particulates to the level suggested by some of these studies?

Mr. BRENNER. Should we decide that it's necessary to tighten the particulate standard, there are very few major sources in this country that would not potentially be affected. Particle emissions come from sources such as cars, trucks, buses, powerplants, most of our major plants and factories other sources that burn fossil fuel and the agricultural sector.

Senator BAUCUS. No large stationary source would comply?

Mr. BRENNER. Some of them may well comply already with what the eventual standard will be. However, once the new standard is set, we would have to look at all of them for opportunities to achieve additional reductions and find out what would be the most cost effective way to achieve the new standard.

Senator BAUCUS. What about the composition of particulates, Mr. Ware. You hinted at it. Some increase mortality and morbidity I guess than other kinds of particulates, I guess. Could you expand on that, please? Which are the worse? Which are not so bad?

Mr. WARE. Let me say a couple of things. First, as you know, the standard is based upon size alone. The PM_{10} includes everything under 10 microns aerodynamic diameter. Actually, it was mentioned to me during the break that one place to get exposure to fine particulates is on the beach because of the sea salt and the windblown sand. We hope that it's not harmful to human health to go to the beach.

On the other hand, that's where we really do need more work five or six years ago, some scientists thought that the real issue was the acidity of fine particulates, particularly as they are produced by combustion of fossil fuels. So a number of investigators have attempted in these epidemiologic studies to see whether the data point to the acidity of particles as a more effective explanation, but I would say the evidence has been equivocal in that.

Senator BAUCUS. What about fugitive dust?

Mr. WARE. Again, it's difficult. To my knowledge, there is no study in this group that really adequately clarifies the role of fugitive dust. I think where we are right now is still with a lot of uncertainty. We recognize the importance of this question, but this, I

think is going to be one of the important frontiers of the next round of studies, to begin this characterization.

Senator BAUCUS. Mr. Brenner, you heard the grades for EPA and the Congress, what are your grades?

Mr. BRENNER. For whom?

Senator BAUCUS. All three?

Mr. BRENNER. It's a different situation trying to grade States. There are 50 of them out there. I don't think it would be fair to give an average when you know some are going to be well above and some are well below.

Senator BAUCUS. They gave an average.

Mr. BRENNER. They may have decided to do that but from my perspective, States have worked hard to implement this Act and it's a very challenging set of goals. They've had to face some outside challenges which I'm very sympathetic to. And they have to deal with their own State legislatures.

Senator BAUCUS. What grade would you give EPA? I think your grade was modified from a D up to about a C minus if I recall.

Mr. BRENNER. I would give EPA a much better grade than that.

Senator BAUCUS. What explains the difference in assessment, yours and theirs?

Mr. BRENNER. I think I'm probably more cognizant of and more sympathetic to some of the constraints that we face at EPA in trying to accomplish the goals of the statute, the kinds of resource constraints and the gridlock problems I mentioned. That's one reason.

The other reason is I think I would tend to give EPA more credit for what's actually happening in air quality out there. As I mentioned earlier, ozone levels are down dramatically; CO levels are down even more dramatically. I think that's important.

Senator BAUCUS. If you're correct, it sounds like a communications problem between States and the EPA.

Mr. BRENNER. To be fair to the States, some of the things that affect them most, some of the guidances, some of the timeliness on rulemaking, some of the things they really need to be effective, we have not been able to do as well as I would have hoped. That is frustrating for them and I can understand why looking at it from their perspective, they would give us low grades. I wish we had done better in many of those areas.

Senator BAUCUS. What sanctions do we come up with to make sure that EPA meets these deadlines? Someone suggested, and I think it's accurate, EPA essentially is operating in receivership, it's under so many court orders because EPA hasn't met its deadlines. It's not a good situation to be in, receivership.

Mr. BRENNER. Your are right, it limits our ability to set our priorities. But these are sanctions. When we miss a deadline, we get sued pretty soon thereafter.

Senator BAUCUS. That's not a good situation to be in.

Mr. BRENNER. That's right and that gives us the incentive to try and develop new approaches like the ones mentioned. We are trying to reform the SIP processing system so that we can delegate more authority to the regions and trying to figure out ways to better provide diffusion of information from State-to-State so that when one States does a good job in an area, they can look at the

electronic bulletin board and figure out what other States are doing good jobs in other areas and take advantage of those. We want them to take advantage of successes in one State and have that happen in other States.

Senator BAUCUS. I think since I've been on this committee—I think I can speak for the members of the committee—I've been very frustrated with EPA not meeting deadlines over the years. As far as I'm concerned, that's going to change for a whole host of reasons which I won't get into and most of which are obvious. I'm just telling you I'm going to do what I can to turn that around. Since I took over chairmanship of this committee, there are several things I want to change and that's one of them. I'm just telling you now so we can begin to think of a way to make that happen.

Mr. BRENNER. You have indicated your willingness to work with us to make sure these changes take place. We are very grateful for at the agency and we'd like to work with you. As I said, although we have accomplished a lot, I wish we had accomplished more. We're ready to work with you.

Senator BAUCUS. Thank you, Mr. Chairman.

Senator LIEBERMAN. Thank you, Senator Baucus.

I have no further questions.

Thank you also, Senator, as Chairman of the Full Committee, for sticking with us through the hearing. It's a measure of your continuing commitment to the Act and to cleaner air.

I thank the members of this panel who have been responsive and helpful. We're going to continue these inquiries. This is actually the first of four hearings that the subcommittee. The next is on September 16th by the full committee.

We'll keep the record for this hearing open for three additional weeks if anyone wants to submit additional testimony.

I thank you all again. The hearing is adjourned.

[Whereupon, at 12:25 p.m., the subcommittee was recessed, to reconvene at the call of the Chair.]

[Statements submitted for the record follow:]

TESTIMONY OF THOMAS M. ALLEN, DIRECTOR, NEW YORK STATE DIVISION OF AIR RESOURCES

Good morning. My name is Thomas M. Allen and I am the Director of the New York State Division of Air Resources. I appear here today on behalf of STAPPA—the State and Territorial Air Pollution Program Administrators—and ALAPCO—the Association of Local Air Pollution Control Officials.

STAPPA and ALAPCO are the two national associations of air quality officials in the 55 States and territories and more than 165 major metropolitan areas across the country. The associations' members have primary responsibility under the Clean Air Act for ensuring healthful air quality for our citizens and represent the technical expertise behind the implementation of our nation's air pollution control laws and regulations. I am very pleased to have this opportunity to present STAPPA and ALAPCO's perspective on the implementation of Title I of the Clean Air Act Amendments of 1990.

First and foremost, I would like to applaud you, Senator Lieberman, Senator Baucus, Senator Chafee and the rest of your colleagues for your role in developing the Clean Air Act Amendments of 1990. In spite of the daunting responsibilities with which we are charged under the Act, we believe we are fortunate to have this comprehensive and effective statute as the framework for our efforts and we remain committed to successful implementation.

Roles of Government

Under the Clean Air Amendments of 1990, various levels of government are assigned distinct responsibilities. The federal government, particularly the U.S. Environmental Protection Agency, is charged with the task of developing National Ambient Air Quality Standards to protect public health and welfare, promulgating federal regulations and guidance, delegating responsibilities to state and local agencies, conducting research, providing funding to state and local air quality agencies, publishing various technical assistance documents and providing sufficient training opportunities.

Likewise, state and local air pollution control agencies are called upon to carry out mandates of the Clean Air Act ranging from developing attainment strategies, to permitting and monitoring tens of thousands of sources across the country, to enforcing laws and regulations to ensure compliance with the Act.

Although the roles assigned by the Act are explicit, it remains clear that all levels of government share in the ultimate responsibility of providing the public with clean, healthful air. Moreover, if we are to be successful in our missions, it is imperative that each level of government fulfill its statutory obligations in a timely manner.

Air Quality Trends

As we near the end of our third year of implementing Title I of the Clean Air Act Amendments of 1990, we are beginning to reap the benefits of our efforts. In many areas, ozone precursor emissions are decreasing. According to EPA's most recent analysis of air quality data ("National Air Quality and Emissions Trends Report, 1991"), volatile organic compound emissions decreased by 4 percent between 1990 and 1991, while nitrogen oxide emissions declined by 3 percent. Violations of the ozone standard also fell during this period. Of the 41 Marginal nonattainment areas that existed at the time of enactment, 28 met the ozone standard based upon data from 1989–1991. In addition, 12 of the 33 Moderate nonattainment areas monitored air quality in compliance with the standard during the same period. Similar statistics eat for carbon monoxide. For example, of the 42 areas that were not in attainment at the time of enactment, 13 have monitored air quality in compliance with the CO standard during the period of 1990–1991. Preliminary ozone and carbon monoxide data for 1992, and even 1993, confirm this trend.

While favorable meteorological conditions have played a role in improved air quality, much of the enhancement can indeed be attributed to measures embodied in the Clean Air Act, including, but not limited to, gasoline volatility limits ad vehicle inspection and maintenance.

SIP Strategies

Notwithstanding these successes, however, we still face an enormous and arduous task. Accordingly, many of our efforts since enactment have focused on implementing Title I and developing the appropriate state strategies required under the Clean Air Act for meeting the health-based air quality standards.

Mr. Chairman, you have specifically asked that we provide the Committee with a status report of the State Implementation Plan submittals that were due on November 15, 1992, as well as a summary of the headway states are making in submitting the 15-percent rate of progress plans due this November.

With respect to the November 15, 1992 SIP deadline, states were required by the Clean Air Act to submit to EPA within two years of enactment a SIP revision that contained several important features, depending upon the area's classification Collectively, these included over 1,000 elements, such as comprehensive emissions inventories, corrections to deficiencies in reasonably available control technology rules, vehicle inspection and maintenance programs, revised new source review regulations, Stage II vapor recovery, employee commute option programs, oxygenated fuels rules and small business technical assistance programs. While states submitted approximately two-thirds of the required elements by the November 15, 1992 deadline, we now expect that most will fulfill their entire obligations within the next several months, and certainly before sanctions take effect.

More recently, we have made considerable efforts to develop plans for achieving reasonable further progress toward attainment of the ozone standard Specifically, the Act requires all Moderate and above ozone nonattainment areas to reduce emissions of smog forming volatile organic compounds (VOCs) by 15 percent from 1990 levels by 1996. By November 15 of this year, states must submit revisions to their State Implementation Plans demonstrating how this reduction will be achieved. The members of STAPPA and ALAPCO believe that this requirement represents one of the most critical responsibilities currently facing ozone nonattainment areas.

As the November 15, 1993 deadline for submitting 15-percent plans nears, the challenges of identifying, quantifying and implementing measures sufficient to achieve such a reduction are becoming increasingly apparent, particularly in light of the absence of anticipated federal regulations (non-road engines, reformulated gasoline, etc.) and Control Technique Guidelines for many heretofore uncontrolled sources of pollution.

These delays have caused tremendous uncertainty in many states, particularly where agencies are relying upon the emissions reductions expected from these measures. Without timely issuance of EPA regulations and guidance, it will become extremely difficult for states not only to predict what measures they will need to demonstrate the 15-percent reduction, but to adopt these measures in rule by the November 15, 1993 deadline.

Notwithstanding these federal delays, we recognize that we must still comply with the law and, accordingly, are taking our responsibilities very seriously. STAPPA and ALAPCO, in cooperation with EPA, are preparing a guidance document intended to assist state and local air pollution control agencies in developing their 15-percent plans by this November. The STAPPA/ALAPCO document, due to be published later this month, will include a comprehensive menu of stationary, area and mobile source control options that should be considered for possible inclusion in a 15-percent reduction strategy. For each option we will provide information on available technologies, cost estimates, and suggested controls.

For many areas, reducing VOC emissions by 15 percent by 1996 will necessitate the implementation of innovative air pollution control strategies. In fact, most areas will not have the luxury of ignoring any strategy that has been determined to be technologically feasible and cost-effective. For example, in New York, we are requiring not only the federally mandated control measures, such as enhanced inspection and maintenance, reformulated gasoline and an employee commute option program, but we have adopted regulations that extend beyond the federal requirements, including controls on smaller businesses, restrictions on consumer products (e.g., paints and air fisheners) and the California Low Emitting Vehicle program. Similar measures are also being contemplated in most other Serious, Severe and Extreme nonattainment areas, including the Washington, DC metropolitan area.

We are also considering pollution prevention measures as a strategy to meet the 15-percent requirement. For example, many of the transportation control measures state and local agencies are considering, such as employee trip reduction programs, have a strong pollution prevention component. Additionally, many states are considering rules for the printing and coating industries that encourage the use of water-based inks and coatings and less volatile solvents.

Though we anticipate that most agencies will submit 15-percent plans by this November, for some, submission of a complete plan, including a full set of adopted rules, will be difficult. While we have tried in good faith to meet our statutory obligations, some of us will simply need a little more time. We are, therefore, grateful that Congress had the foresight to provide an 18-month delay before nondiscretionary sanctions are imposed.

I would like to discuss two major federal measures in particular that will be vital to our efforts to meet the 15-percent requirements: transportation conformity—or, ensuring that transportation plans, programs and projects are consistent with air quality implementation plans and the health-based national air quality standards—and reformulated gasoline.

Transportation Conformity

As you are well aware, motor vehicles account for at least one-half of the volatile organic compound and nitrogen oxide emissions in a majority of ozone nonattainment areas and for most of the carbon monoxide emissions in CO nonattainment areas. In most of these areas, attainment of the standards will not be possible unless significant reductions in motor vehicle emissions are achieved. Moreover, it is becoming increasingly apparent to state and local air quality agencies that the minimum federal control strategies, such as reformulated gasoline, enhanced motor vehicle inspection and maintenance, gasoline volatility limits, federal tailpipe standards and alternatively fueled commercial fleets, will not yield VOC and NO_x reductions sufficient to provide for attainment and maintenance of the standards. Accordingly, it is imperative that the transportation sector become a active and responsible partner in ensuring that motor vehicle emissions and vehicle miles traveled are accurately accounted for and effectively controlled.

STAPPA and ALAPCO commend Congress, and this Subcommittee in particular, for significantly strengthening the conformity provisions of Section 176(c) of the Act Further, we applaud you, Senator Lieberman, and your colleagues, Senators Baucus,

Chafee, Durenberger and Moynihan, for your letters to EPA Administrator Browner and DOT Secretary Pēna urging them to place a high priority on the development of a final transportation conformity rule and supporting the substantive direction taken by STAPPA and ALAPCO in our alternative proposed transportation conformity regulation.

The potential for a weak transportation conformity regulation to seriously undermine air quality control strategies can not be overstated. Consequently, STAPPA an ALAPCO are extremely concerned that the current EPA proposed rulemaking on transportation conformity, developed during the last Administration in cooperation with DOT, is inconsistent with the intent of Section 176(c) to ensure that transportation investments actually contribute to improved air quality.

Though the issue of transportation conformity is a very complex one, our message today is simple—it is essential that the final transportation conformity rule now being developed by EPA ensure that all sectors of society contribute their fair share toward cleaner air. To the extent that the transportation sector is not called upon to achieve emission reductions proportionate to its contribution to pollution, responsibility for achieving these reductions will fall upon other sectors and will necessitate additional controls on stationary and areas sources, including small "mom and pop" businesses. In short, we must ensure that an equitable process is established.

Reformulated Gasoline

It is also important that EPA honor the historic agreement reached nearly two years ago, based on a regulatory negotiation, on reformulated gasoline. STAPPA and ALAPCO were pleased to participate in the regulatory negotiation convened by EPA to develop the reformulated gasoline program mandated by the Clean Air Act. This year-long process resulted in what we believed to be a successful outcome, marked by the signing of an agreement that, remarkably, achieved the best of all worlds—environmental protection, fairness and certainty for industry. Moreover, the product of the negotiation, which resulted from painstaking compromise, was agreed to unanimously by all the participants, including representatives of state and local air pollution control agencies, the oil industry, the ethanol and methanol industries, the automotive industry, environmental groups and the Bush Administration.

Unfortunately, last year, certain constituents of the ethanol industry successfully lobbied then-President Bush to revise the agreement. This revision not only represented a breach of good faith, but we strongly believe it would result in detrimental air quality impacts, particularly from the commingling effects expected to occur from the changes.

It is now critical that EPA honor its commitment to the regulatory negotiation and revert to the provisions in the original agreement on reformulated gasoline.

Small Particulates (PM_{10})

Finally, I would like to address the implementation of control programs for small respirable, airborne particles known as PM_{10} a criteria pollutant also regulated by the Clean Air Act but often overshadowed by ozone.

Currently, 70 areas across the country are designated as nonattainment for PM_{10} while another 12 have been proposed by EPA for designation as nonattainment. Further, air quality data for the past few years suggest that there may be as many as 20 additional areas across the country that exceed the National Ambient Air Quality Standard for PM_{10}.

To say that the health effects related to PM_{10} exposure are severe is probably an understatement. PM_{10} poses a greater risk for both acute ad chronic health impacts than any other criteria pollutant. In fact, based upon epidemiological data, it has been estimated that as many as 60,000 excess deaths occur each year from exposure to PM_{10} at levels well below the current health-based standard. Clearly, this is a public health threat that can not, and must not, be overlooked.

As we seek to control PM_{10} two of the most critical challenges we face include ones related to monitoring and methods of control. First, in that the PM_{10} program is one limited by monitoring, it is critical that efforts be focused on evaluating current PM_{10} monitoring networks to ensure that they adequately characterize PM_{10} problems. Second, unlike most pollution problems, the root of PM_{10} problems frequently is not the traditional industrial sources, but more nontraditional sources, such as fugitive dust, woodstoves, construction and agricultural emissions and diesel engines. Unfortunately, control strategies, such as those currently being considered by EPA, tend to focus primarily on regulating industrial sources of emissions, a tactic that dissipates precious resources on measures that will have relatively little air quality benefit.

How EPA Can Help

Mr. Chairman, you also have asked for suggestions on what EPA might do to assist our efforts in complying with the requirements of the Clean Air Act. I wish to offer the following.

First, it is absolutely imperative that EPA publish rules in an expeditious manner, since so many of our actions are directly dependent upon timely issuance of EPA regulations. When EPA misses a deadline, the agency is sued, and generally receives a later court-ordered deadline. When states miss deadlines, irrespective of the reason, we face mandatory sanctions, including the withholding of hundreds of millions of dollars in federal highway funds and what amounts to a ban on constructing new facilities or making major modifications to existing ones.

Second, it is extremely important that EPA make good decisions. If the agency's rules become so "watered down" that they are not capable of achieving appropriate emissions reductions from major air pollution sources (e.g., transportation sector), state and local agencies will be forced to compensate for those lost opportunities by imposing more stringent and less cost-effective regulations on other sources of pollution (i.e., small businesses). We face a "zero sum game" in reducing air pollution; therefore, it is vitally important that all sources contribute their fair share to reducing emissions.

Third, it is becoming increasingly evident that state and local agencies will be required to adopt rules well beyond the minimum federal requirements if they expect to attain and maintain the air quality standards. Accordingly, it is essential that EPA support these states to the maximum extent possible and empower them to pursue these additional strategies. For example, EPA should be doing everything within its power to support states' efforts to opt into the California Low Emitting Vehicle program and the federal reformulated gasoline program.

Fourth, EPA should continue to provide state and local agencies with the excellent technical support it has been furnishing us, including electronic communications and bulletin boards, technology clearinghouses, etc.

Finally, EPA could assist in a number of specific programmatic areas, including, but not limited to, strengthening inventories for area and mobile sources, enhancing regional modeling activities and refining the ozone ambient monitoring program.

In conclusion, you have asked us to grade EPA's performance with respect to the timeliness and substance of several regulations that STAPPA and ALAPCO believe are important in our efforts to attain and maintain the National Ambient Air Quality Standards. We have identified five important EPA regulations—transportation conformity, reformulated gasoline, vehicle inspection and maintenance, Control Technique Guidelines, and Reasonably Available Control Technology for nitrogen oxides (NO_x RACT)—and have attached our assessment of EPA's performance to our testimony. We wish to offer two caveats, however. First, some of these rules (e.g., conformity and reformulated gasoline) were developed during the previous Administration and could now be significantly revised and improved. Second, in several cases, other federal departments within the Administration have participated in the rulemaking, affecting both the timeliness and quality of EPA's regulatory proposals and, consequently, influencing our grades.

Thank you, Senator Lieberman, and this Subcommittee, for holding this hearing, which demonstrates your commitment to ensuring that the goals of our environmental statutes are achieved. Your continued attention to and oversight of Clean Air Act implementation issues are key to the success of our efforts.

Once again, I appreciate this opportunity to testify today and, on behalf of STAPPA and ALAPCO, offer whatever assistance we can provide as you continue to evaluate this important issue.

Appraisal of Progress of the U.S. Environmental Protection Agency in Implementing Title I of the Clean Air Act

	Timeliness of Issuance	Quality of Rule	Comments
Transportation Conformity	D	D+	The Bush Administration developed a proposed rule that does not adequately address attainment areas, non-federally funded projects, the role of state and local air quality agencies, etc. The Clinton Administration is under a court-ordered deadline to issue the final rule.
Reformulated Gasoline	D	D	President Bush, responding to ethanol interests, overturned the product of a successful regulatory negotiation, both delaying the rule and jeopardizing air quality. If the Clinton Administration reverts to the negotiated rule, the grade for "Quality of Rule" would be "A."
Inspection and Maintenance	C	A-	Although EPA was almost a year late in publishing final I/M rules, the regulations were of high quality and generally responsive to state and local agencies.
Control Technique Guidelines	D-	C+	While EPA is required to publish all of its CTGs by this November, the agency is expected to miss this deadline for almost every one. Most states are dependent upon these documents in meeting their November 15th SIP submittals.
NO_x Reasonably Available Control Technology	D	D	EPA published NO_x RACT guidance months after STAPPA/ALAPCO and other regional groups (e.g., NESCAUM) had published their own documentation. The EPA guidance, much weaker than the states' guidance, undercut ongoing state and local regulatory efforts.

prepared by the
State and Territorial Air Pollution Program Administrators
and the
Association of Local Air Pollution Control Officials

August 3, 1993

TESTIMONY OF TIMOTHY R. E. KEENEY, COMMISSIONER CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION, ON BEHALF OF THE OZONE TRANSPORT COMMISSIONS

Good Morning. My name is Timothy Keeney, and today I am representing the Ozone Transport Commission, known as the OTC. As Commissioner of the Connecticut Department of Environmental Protection, I represent the Governor of Connecticut on the Commission.

First, I would like to thank you for the opportunity to appear before you today. I am very pleased to represent the Commission before this Subcommittee as it reviews progress under Title I of the Clean Air Act, which addresses nonattainment of the National Ambient Air Quality Standards. This is the first time that a Congressional subcommittee has reviewed the work of the Commission, which we feel has been a major step forward in promoting the respiratory health of the residents of the Northeast and Mid-Atlantic States. The Commission itself is a relatively new organization, having been created in the Clean Air Act Amendments of 1990. The Commission had its first meeting in May of 1991, and has met eight times since then.

The Commission was created with the recognition that there has historically been a major ozone nonattainment problem in our region, and that much of the problem is due to regional transport of ozone and ozone precursors. Ground level ozone, the primary constituent in photochemical smog, is produced when emissions of volatile organic compounds, or VOC, and nitrogen oxides, or NO_x, chemically react in the presence of sunlight. High levels of ozone tend to occur in the warm weather months, when climatic patterns encourage the formation, concentration, and transport of ozone within the Northeast and Mid-Atlantic States and particularly in our heavily populated urban areas. High levels of ozone have been demonstrated to have detrimental effects on human health, particularly for those people with existing respiratory disease, as well as depressing effects on crop yields and forest growth.

Along with the new requirements of Title I of the Act, which specify requirements for ozone nonattainment areas depending on the level of severity, the Amendments created an Ozone Transport Region, or OTR, with a specific set of additional retirements designed to address the regional transport problem. The OTR includes all of New England, New York, New Jersey, Pennsylvania, Delaware, Maryland, the District of Columbia, and the portion of Virginia within the Washington Consolidated Metropolitan Statistical Area. The Act also specifies that whenever an OTR is created that there be an Ozone Transport Commission to take responsibility for coordinating OTR ozone control efforts. With the establishment of the OTR, the Commission was then organized according to statutory retirements to include representatives of the twelve Governors of the twelve Member States, and the Mayor of the District of Columbia, and air pollution control representatives of the thirteen jurisdictions. A designee of the EPA Administrator and representatives of EPA Regions I, II, and III, also sit on the Commission, but according to the Act, they are not allowed to vote.

MODELING AND MONITORING RESULTS: THE IMPORTANCE OF NO_x

The Act indicates that the Commission "shall assess the degree of interstate transport of the pollutant or precursors to the pollutant throughout the transport region." As a result of the work of the States of the Commission, in conjunction with support from EPA, the Commission has done substantial work to evaluate the ozone problem in the OTR. Specifically, EPA and the Commission have worked cooperatively to complete Regional Oxidant Model, or ROM, simulations of ozone formation and transport within the OTR. The results of these simulations have received much analysis, but two important themes come through:

1. The combined effects of VOC and NO_x emission reductions specifically rehired by the Clean Air Act are very effective in reducing ozone, but they do not appear to be sufficient to reduce ozone concentrations to the level of the ambient ozone standard throughout the OTR; and
2. For additional controls beyond those specifically called for by the Act, NO_x emission controls appear to be more effective than VOC controls, though VOC controls need to continue to play a role in core urban areas.

These themes are consistent with the findings of the National Academy of Science's December 1991 report "Rethinking the Ozone Problem in Regional and Urban Air Pollution."

In addition to the ROM results, we have also started efforts to examine ozone with the Urban Airshed Model, or UAM, which will be the model used to support the State Implementation Plan revisions to be submitted in November 1994. Results

to date, specifically for the New York City metropolitan area, show that UAM predictions are directionally consistent with those of ROM. This provides additional assurance that we need to move aggressively on new VOC and NO_x controls, and that on an area wide basis NO_x controls need to be given priority when controls beyond those of the Clean Air Act are developed.

At this point, I would like to point out that the ozone problem is not just an analytical effort, but a present problem with real health implications. While we believe that important progress in emission reductions have been made over the years, more still needs to be done, and our recent monitoring results over the last month confirms this. During the heat wave in our region in July, and to a certain extent in June, numerous exceedances of the ambient ozone standard were recorded. Attachment 1 to this prepared statement shows a list of these exceedances over the Federal standard of 120 ppb through the middle of July. This data still of course needs further quality assurance. However, these readings underscore the fact that we need to take ozone control seriously, and that we need to move ahead now to adopt the controls that will bring about both attainment and maintenance of the standards in the future.

PROGRESS IN STATE IMPLEMENTATION PLAN REVISIONS

In your letter of invitation, you asked specifically about our progress in submitting the State Implementation Plan revisions due on November 15, 1992. We believe that we have done well in our efforts to meet the Act's requirements for these revisions, despite substantial delays in EPA guidance and the number of retirements involved. Different States have different regulatory adoption requirements, and as a result there has been a fairly wide range of times of completion for regulatory adoption activities and submittal to EPA. Nevertheless, we believe that we have been successful in the task we set out to complete. We have provided your staff with a report produced by the Commission in January of this year which summaries our progress with the 1992 submittals at that time. Items documented as incomplete in this report have generally either been completed or are in the process of being completed.

Given the importance of NO_x to our overall attainment planning efforts, I would like to take some time to discuss what we have done specifically on NO_x control regulations. On March 10, 1992, we adopted a Memorandum of Understanding signed by all of our Member jurisdictions to adopt Reasonably Available Control Technology regulations for major stationary sources of NO_x (Attachment 2). NO_x RACT is part of a foundation of an attainment strategy, and it is rehired by the Act. In addition, as I mentioned before, we know that over the long run that we are going to need even more NO_x reductions than the Act specifically requires, so implementing NO_x RACT expeditiously is an important first step.

The MOU specifies that NO_x RACT should be based on combustion modifications and that additional NO_x control should be based on need as demonstrated by modeling results. Since the approval of this MOU, States have moved ahead to adopt their NO_x RACT regulations, and our modeling efforts have intensified. As indicated above, based on our results to date, it does appear that additional NO_x controls will be necessary in order to reach attainment in the OTR.

ADDITIONAL MAJOR CONTROL MEASURES CONSIDERED OR APPROVED BY THE OZONE TRANSPORT COMMISSION

Given our NO_x results to date, the Commission in January of 1993 directed the OTC Mobile and Stationary/Area Source Committees to review additional NO_x emission control measures. Since that time, both Committees have held meetings to consider such additional measures. Presentation by outside organizations have been encouraged. It is worth noting that under the Commission Bylaws, all Committee meetings and all full Commission meetings are open to the public, and we make every effort, especially in our Committee meetings, to solicit ideas and comments from the public. It is anticipated that the Committees will make reports to the Commission on their findings, and these reports would be the starting point for the Commission to take additional actions on any additional cost effective regional NO_x control measures.

The Commission has also given major priority to controlling mobile source emissions. Mobile sources are the largest single contributor to ozone precursors within the OTR, and therefore it is important to summarize their contributions at both the time of purchase and as they are used. This philosophy is embodied in the MOU adopted by the Commission in 1992 on an overall integrated mobile source control strategy (Attachment 3). This strategy includes:

- Enhanced inspection/maintenance (I/M);

- Federal reformulated gasoline;
- Transportation control measures; and
- Low Emission Vehicles.

I will address each of these separately.

The Act requires enhanced I/M in all Metropolitan Statistical Areas over 100,000 in population within an Ozone Transport Region. As a result, as a group the States of the Commission are responsible for a substantial majority of the vehicles in the country which will be subject to enhanced I/M. Given the enhanced I/M requirement in the OTR, and the important emission reductions that enhanced I/M can bring about, enhanced I/M has been a major priority for the Commission. The latest action by the Commission in this area started with a resolution passed in January of this year calling on cooperative efforts among those involved with automotive service to work with the Commission in defining enhanced I/M solutions and coming up with workable solutions. Such efforts should ensure that vehicles with emission related problems are repaired correctly, and should promote public acceptance of the program. Good maintenance will thus be critical to the success of enhanced I/M, and the Commission has recently come up with an initiative which is intended to encourage enhanced I/M pilot programs with a strong emphasis on the upgrading of technician skills. Our problem to date with the initiative has been a lack of funding, but we intend to investigate potential sources of financial support over the next several months to get this effort going.

For reformulated gasoline, the Commission adopted an MOU in 1991 which commits the States to "opt in" to Federal reformulated gasoline for all nonattainment areas within the OTR. All States with nonattainment areas have now submitted their formal requests to EPA. With respect to transportation control measures, their development has historically been on a metropolitan area by metropolitan area basis, and Commission actions to date do not change that. However, good transportation planning that integrates air quality as a consideration into the planning process is important, and the OTC MOU of 1992 supports these efforts.

THE LOW EMISSION VEHICLE PROGRAM

The Low Emission Vehicle (LEV) program has been a critical element of the Commission's efforts to date. The LEV program was initiated by the State of California, and under Section 177 of the Clean Air Act, States have the authority to adopt California emission standards for vehicles sold in their States. Based upon a substantial amount of information developed by the States of the OTC, the State of California, and elsewhere, the Commission is convinced that the emission reductions from LEV are both effective and cost effective. It is worth pointing out that LEV provides *both* VOC and NO_x emission reductions. Such reductions are helpful for both attainment and maintenance of the ambient ozone standard. In addition, LEV provides a significant reduction in motor vehicle toxic air pollutants As a result, the Commission has consistently promoted the development and adoption of LEV programs by OTC States.

To date, five States—Maine, Maryland, Massachusetts, New Jersey, and New York—have adopted LEV by either regulation or legislation. Nevertheless, adoption of the program has not been easy. As many of you know, opposition from the automobile industry has been unbending, despite recent data from the California Air Resources Board that shows the costs of the program are even lower than our cost effectiveness analyses have assumed, and despite continuing air quality problems in the region.

It is important to note that, in addition to effectiveness and cost effectiveness reasons, our support for LEV is based as well on statutory requirements for attainment demonstrations in our State Implementation Plans. We must also show a 3% annual emission reduction starting in 1996, and in most OTC States, LEV has the potential to help meet that requirement as early as 1998. It is not clear there these reductions will come from without the LEV program.

In part because of this central role of LEV in our ozone control efforts, the Commission at its Annual Meeting in May decided to form an ad hoc Committee to study the 184(c) recommendation process, a Committee I now chair. Under Section 184(c) of the Act, the Commission may recommend to EPA that EPA require a particular control measure in the State Implementation Plans of the OTC States. EPA then has nine months to act on the recommendation. The Commission has charged the Committee with providing them a report on the 184(c) process along with any specific recommendations they may have, at the Fall Meeting of the Commission, scheduled to be held in Connecticut on October 19.

In summary, let me say this about LEV and the State Implementation Plan process. We believe that States should have choices in what strategies need to be in

their plans to reach attainment, and Section 1TI gives us this choice on LEV. As a practical matter though, it is very difficult to see how we will be able to meet the requirements of the Act without LEV. We will need all the help possible from EPA and others to ensure effective implementation of LEV and other strategies to ensure attainment and maintenance of the ambient ozone standard.

EMISSIONS TRADING INITIATIVES BY THE COMMISSION

Along with the commitment to expeditiously attain the ambient ozone standard, the Commission is also committed to implement emission control programs cost effectively, and to explore mechanisms beyond traditional command-and-control regulations to reach this goal. As a result, over the past eighteen months, the Commission has been investigating how economic incentives, especially emission trading programs, could help in this effort.

The Commission believes that air quality protection and economic growth can be and should be compatible. As a result, our main focus has been on new sources, and the requirements for emission offsets, especially NO_x emission offsets, in the OTR. This is a new requirement contained in the 1990 Amendments, and the Commission has wanted to ensure that new economic growth is facilitated within the context of our overall plans an attainment of the ozone standard. It is for this reason that the Commission has focused on emissions trading to enhance the potential supply of NO_x emission offsets, first on a state-by-state basis, and then possibly on an interstate basis.

Emissions trading programs are not new, and several States within the OTC have been involved in emissions trading activities since EPA issued its emissions trading policy in the mid-1980's. During 1992 and 1993, the Commission, through its Stationary/Area Source Committee, thoroughly reviewed emissions trading issues and experience. As a result of this review, it was decided to focus first on developing similar intrastate NO_x emission offset trading programs. The Commission's rationale was that before any meaningful interstate system could be considered, that the major elements of individual States' programs had to mesh. In this way, the way that emission reduction credits, or ERCs, are calculated, created, certified, and used would be essentially the same from State to State. While it was not critical that each State develop their programs identically, the Commission decided to focus on those program elements of State programs that would ensure compatibility, so that an interstate program in theory could be developed.

In early 1993, the Commission decided to ask EPA to give their thoughts on several key issues regarding the way that an interstate system of NO_x emissions offset trading programs could be instituted. A copy of that letter, along with the EPA response, is attached to my prepared statement (Attachments 4 and 5). While I will not attempt to go into these issues in detail, I will mention a few key issues. First, there are two key requirements within the Act for NO_x offsets: that the offsetting emissions must come from an area with an ozone nonattainment classification at least as severe as that of the location of the new emissions, and that there be a beneficial air quality impact from the trade. Any system of interstate offsets must recognize these two requirements. Second, we believe that there is a fundamental difference in the way offsets should be approached in the attainment areas and in the nonattainment areas within the OTR. In many cases, attainment areas are less urbanized and industrialized than nonattainment areas, and the availability of offsets, particularly within a single State, may be limited. As long as air quality in the region is protected, we believe that more flexibility should be built into any offset requirements for attainment areas.

In our exchange of letters with EPA, the issues related to a potential interstate offset program were not fully resolved, but EPA did offer its assistance in working with the Commission to develop the details of such a program. We intend to contact EPA in the very near future to push forward with this effort.

After several Committee meetings, including one devoted to public comment, a Memorandum of Understanding was drafted, based on the eleven common elements of intrastate NO_x emission trading programs developed through Committee deliberations and information from the public. This MOU was then approved on May 18,1993, at the Commission's Annual Meeting in Spring Lake, New Jersey (Attachment 6). Ten of the OTC's Member States signed the MOU at that time. The District of Columbia, Vermont, and Virginia indicated that they needed more tee for review and consultation, and since that time, Vermont has now also signed the agreement.

We now intend to go forward with a full scale investigation of how an interstate NO_x emission trading program would be set up. We fully recognize the magnitude of this challenge. This would be the first time that such an interstate trading program would be set up for a criteria pollutant. This effort of course is complicated by the

fact that we are in the process of putting together State Implementation Plans to provide for attainment of the ozone standard at the same time. While this is a challenge, we also believe this is also an opportunity for integrating economic incentives into our attainment planning from the beginning, rather than overlaying new programs onto established regulatory plans. In this way, we believe that we can maximize both the environmental and the economic benefits to our region as a whole.

CONCLUSION

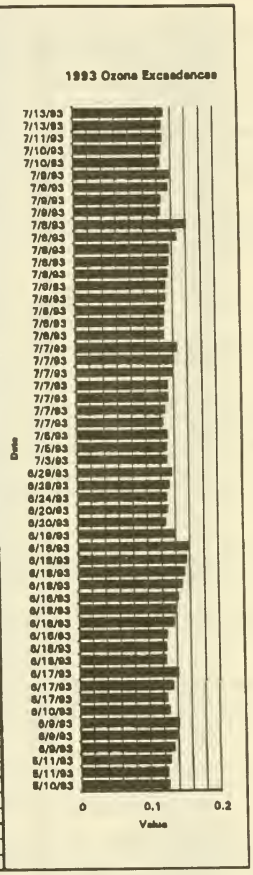
The challenges in front of the Commission are substantial, as we try to ensure long term attainment of the ozone standard in the Northeast and Mid-Atlantic States. As I have indicated, the Commission has embarked on a balanced program of VOC and NO_x emission control, based on both mobile and stationary control measures. In addition to our own efforts, our success will depend both on adequate funding and on the full support of EPA as we draft State Implementation Plan revisions which meet the requirements of the Act.

This concludes my prepared statement. I appreciate the opportunity to offer testimony today and I would be glad to answer any questions you may have.

Attachment i

1993 Ozone Exceedences in the MARAMA Region

Date	Site	State	Value
5/10/93	Clarksboro	NJ	0.127
5/11/93	Fair Hill	MD	0.125
5/11/93	Ancora State Hospital	NJ	0.129
6/9/93	Lums Pond	DE	0.135
6/9/93	Fair Hill	MD	0.138
6/9/93	Fair Hill	MD	0.142
6/10/93	Charlotte	NC	0.129
6/17/93	Aldino	MD	0.126
6/17/93	Rider College	NJ	0.135
6/17/93	Greenbelt	MD	0.142
6/18/93	Rider College	NJ	0.125
6/18/93	Dover	DE	0.126
6/18/93	Lancaster	PA	0.127
6/18/93	Bellefonte	DE	0.137
6/18/93	Lums Pond	DE	0.14
6/18/93	Essex	MD	0.144
6/18/93	Aldino	MD	0.15
6/18/93	Millington	MD	0.153
6/18/93	Fair Hill	MD	0.156
6/18/93	Edgewood	MD	0.16
6/19/93	Ancora State Hospital	NJ	0.138
6/20/93	Norristown	PA	0.127
6/20/93	Roxborough	PA	0.13
6/24/93	Richmond Area	VA	0.129
6/28/93	Edgewood	MD	0.133
6/29/93	Lums Pond	DE	0.136
7/3/93	Davidsonville	MD	0.13
7/3/93	Norristown	PA	0.13
7/3/93	Fair Hill	MD	0.131
7/7/93	Aldino	MD	0.125
7/7/93	Davidsonville	MD	0.128
7/7/93	Richmond Area	VA	0.133
7/7/93	Hanover	VA	0.133
7/7/93	Edgewood	MD	0.139
7/7/93	Colliers Mills	NJ	0.142
7/7/93	Essex	MD	0.146
7/8/93	Southern Maryland	MD	0.128
7/8/93	Charles City County	VA	0.128
7/8/93	Butner	NC	0.129
7/8/93	Suffolk	VA	0.131
7/8/93	Bayonne	NJ	0.131
7/8/93	Davidsonville	MD	0.135
7/8/93	Ancora State Hospital	NJ	0.136
7/8/93	Hampton	VA	0.137
7/8/93	Essex	MD	0.148
7/8/93	Monmouth College	NJ	0.162
7/9/93	Essex	MD	0.125
7/9/93	Edgewood	MD	0.126
7/9/93	Suffolk	VA	0.136
7/9/93	Davidsonville	MD	0.139
7/10/93	Ancora State Hospital	NJ	0.125
7/10/93	Suffolk	VA	0.127
7/11/93	Ancora State Hospital	NJ	0.129
7/13/93	Butner	NC	0.128
7/13/93	McLeansville	NC	0.131

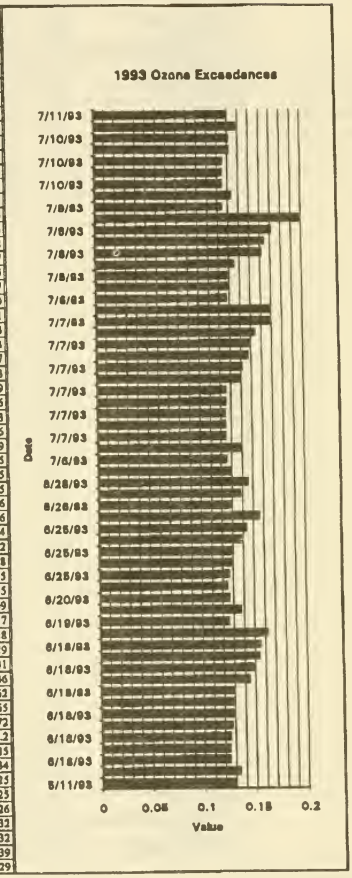


States in MARAMA are: New Jersey, Pennsylvania, Maryland, Delaware, Virginia and North Carolina.

Attachment 1, cont.

1993 Ozone Exceedences in the NESCAUM Region

Date	Site	State	Value
5/11/93	Ancora State Hospital	NJ	0.129
6/17/93	Rider College	NJ	0.135
6/18/93	Rider College	NJ	0.125
6/18/93	Nashua	NH	0.125
6/18/93	Danbury	CT	0.126
6/18/93	Newburyport	MA	0.128
6/18/93	Agawam	MA	0.13
6/18/93	Quabbin	MA	0.13
6/18/93	Sudbury	MA	0.13
6/18/93	Middletown	CT	0.145
6/18/93	Chicopee	MA	0.149
6/18/93	Worcester	MA	0.155
6/18/93	East Hartford	CT	0.156
6/18/93	Stafford Springs	CT	0.163
6/19/93	Groton	CT	0.126
6/19/93	Ancora State Hospital	NJ	0.138
6/20/93	Norristown	PA	0.127
6/25/93	Torrington	CT	0.125
6/25/93	Nashua	NH	0.127
6/25/93	Amherst	MA	0.129
6/25/93	Sudbury	MA	0.131
6/25/93	Quabbin	MA	0.14
6/25/93	Stafford Springs	CT	0.144
6/25/93	Worcester	MA	0.157
6/26/93	Worcester	MA	0.13
6/28/93	Stratford	CT	0.139
6/28/93	Madison	CT	0.146
7/5/93	Norristown	PA	0.13
7/6/93	Amherst	MA	0.126
7/6/93	Millbrook	NY	0.139
7/7/93	Rye	NH	0.125
7/7/93	Kennebunkport	ME	0.125
7/7/93	Riverhead	NY	0.125
7/7/93	New Haven	CT	0.126
7/7/93	Morrisania	NY	0.126
7/7/93	Danbury	CT	0.14
7/7/93	Colliers Mills	NJ	0.142
7/7/93	Madison	CT	0.148
7/7/93	Greenwich	CT	0.15
7/7/93	Bridgeport	CT	0.155
7/7/93	Middletown	CT	0.169
7/7/93	Stratford	CT	0.17
7/8/93	Bridgeport	CT	0.128
7/8/93	Queens College	NYC	0.129
7/8/93	Bayonne	NJ	0.131
7/8/93	Ancora State Hospital	NJ	0.136
7/8/93	Monmouth College	NJ	0.162
7/8/93	Stratford	CT	0.165
7/8/93	Riverhead	NY	0.172
7/8/93	Babylon	NY	0.2
7/9/93	Riverhead	NY	0.125
7/9/93	Kennebunkport	ME	0.134
7/10/93	Babylon	NY	0.125
7/10/93	Ancora State Hospital	NJ	0.125
7/10/93	Madison	CT	0.126
7/10/93	Port Clyde	ME	0.132
7/10/93	Phippsburg	ME	0.132
7/10/93	Groton	CT	0.139
7/11/93	Ancora State Hospital	NJ	0.129



States in NESCAUM are: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York and New Jersey.

Attachment 2

OTC MEMORANDUM OF UNDERSTANDING ON THE NEED TO REDUCE STATIONARY SOURCE NOx EMISSIONS AND ACTIVITIES TO DEVELOP TECHNICAL SUPPORT FOR REGULATORY DEVELOPMENT

WHEREAS the ambient ozone nonattainment problem is pervasive across the northeastern United States; and

WHEREAS the Clean Air Act Amendments of 1990 require NOx Reasonably Available Control Technology (RACT) control regulations in the Ozone Transport Region (OTR) be submitted in SIP revisions by November 15, 1992, with compliance no later than May 1995; and

WHEREAS the Clean Air Act Amendments of 1990 also require SIP revisions including an ozone attainment demonstration be submitted by November 15, 1994, with compliance dates no later than May 1999; and

WHEREAS parts of the OTR have attainment dates as early as 1996 and 1999; and

WHEREAS the December 1991 report on urban ozone by the National Academy of Sciences concluded that there is a need for NOx control in many of the urban areas of the U.S.; and

WHEREAS the modeling simulations performed to date by the U.S. Environmental Protection Agency using the Regional Oxidant Model (ROM) demonstrate the efficacy of NOx control for reducing ozone formation in the OTR; and

WHEREAS there are significant contributions to NOx emissions from both stationary and mobile sources; and

WHEREAS reasonable controls on both stationary and mobile sources of NOx will be necessary for the long-term attainment and maintenance of the ambient ozone standards; and

WHEREAS the OTC has already acted to endorse mobile source control strategies which will reduce the mobile source NOx emission contribution; and

WHEREAS studies by EPA and others have shown that combustion modifications are available and have the potential to provide cost effective NOx emissions reductions at stationary fuel combustion sources; and

WHEREAS additional add-on control technology beyond combustion modifications will be necessary to ensure attainment of the ozone standard in the OTR;

THEREFORE, be it resolved that each of the undersigned member states will proceed with the development of regulations related to RACT requirements based on combustion modifications for significant stationary source categories of NOx for implementation by May 1995; and

Furthermore, that the OTC should in cooperation with the U.S. Environmental Protection Agency continue modeling simulations using ROM and the Urban Airshed Model to investigate the additional amount of NOx reduction necessary to provide attainment of the ambient ozone standard across the OTR; and

Furthermore, additional controls capable of meeting a performance standard based on advanced control technology will be incorporated in 1994 SIP revisions for implementation by May 1999, as needed to attain and maintain the ambient standard for ozone throughout the OTR.

Attachment 2, cont.

Signed this 10th day of March, 1992 by the following:

CONNECTICUT: Timothy R.E. Keeney

DELAWARE: Edwin H. Clark, II

DISTRICT OF COLUMBIA: [illegible]

MAINE: Dean C. Marriott

MARYLAND: Bob Perciasepe

MASSACHUSETTS: Susan J. Kerney

NEW HAMPSHIRE: Robert W. Varney

NEW JERSEY: Scott A. Weiner

NEW YORK: Thomas C. Jorling

PENNSYLVANIA: Catherine W. Cowen

RHODE ISLAND: Louise Durfee

VERMONT: Jan H. Eastman

VIRGINIA: Elizabeth H. Haskell

Attachment 3

MEMORANDUM OF UNDERSTANDING AMONG THE STATES OF THE OZONE TRANSPORT COMMISSION ON IMPLEMENTING AN INTEGRATED MOBILE SOURCE STRATEGY

WHEREAS, the Northeastern United States is faced with a pervasive ozone nonattainment problem; and

WHEREAS most of the member states also have carbon monoxide nonattainment problems; and

WHEREAS motor vehicles are the largest source of ozone precursors and toxic pollutants and emit as well the vast majority of the carbon monoxide emissions; and

WHEREAS regional ozone modeling to date by the U.S. Environmental Protection Agency has shown the need for greater reductions of VOC and NOx emissions for the purposes of reducing ambient ozone concentrations; and

WHEREAS motor vehicle emissions are directly related to vehicle design, the fuels used, the quality of maintenance performed, and the vehicle miles traveled (VMT);

WHEREAS motor vehicle control strategies need to work together to effectively reduce the formation of ground level ozone;

THEREFORE, each state recognizes the need for implementing an integrated mobile source control strategy which focuses on minimizing all types of motor vehicle emissions and

Furthermore, that each state take steps to implement as soon as possible the following cost effective strategies as needed to attain and maintain the ambient ozone standard through the Ozone Transport Region:

- the new vehicle emissions standards of the California Low Emission Vehicle program (see OTC memorandum of understanding of 10/29/91);
- enhanced I/M programs where required by the Clean Air Act Amendments;
- reformulated gasoline (see OTC resolution of 10/29/91); and
- appropriate transportation control measures to limit VMT in metropolitan areas in the OTC region; and

Furthermore, that each state recognizes that the strategies outlined above together will maximize the emission reductions achievable from mobile sources as one part of an overall strategy for ozone attainment.

Attachment 3, cont.

Signed this 10th day of March, 1992 by the following:

CONNECTICUT: Timothy R. C. Kenny

DELAWARE: Edwin H. Clark, II

DISTRICT OF COLUMBIA: _____

MAINE: Dean C. Marden

MARYLAND: Bob Perciasepe

MASSACHUSETTS: Susan F. Tierney

NEW HAMPSHIRE: Robert W. Varney

NEW JERSEY: Scott A. Weiner

NEW YORK: Thomas C. Jorling

PENNSYLVANIA: Catherine W. Cowen

RHODE ISLAND: Louis Flynn

VERMONT: Jan D. Eastman

VIRGINIA: Elizabeth H. Haskell

Attachment 4

OZONE TRANSPORT COMMISSION

Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, District of Columbia

Bruce S. Carhart, Executive Director
444 N. Capitol Street, N.W., Suite 604 • Washington, D.C. 20001

Phone: (202) 508-3840
Fax: (202) 508-3841

Mr. John S. Seitz
Director, Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency, (MD-10)
Research Triangle Park, NC 27711

December 30, 1992

Dear Mr. Seitz:

The Ozone Transport Commission (OTC) has been aggressively investigating the possibility of an interstate system of offsets to respond to the emission offset requirements of the Clean Air Act Amendments of 1990. The OTC has focused both on a group of basic principles which could form the basis of an interstate offset program, as well as individual program elements which individual states could adopt to ease the implementation of such a program. In pursuing these investigations, we have paid strict attention to the requirements of the Clean Air Act, in an effort to create a system which is both environmentally and legally defendable for the entire Ozone Transport Region (OTR).

We are now getting to the point that we will need more direct involvement from EPA, especially as regards legal guidance, as we proceed to proposals for the full Commission to consider. Clearly we wish to ensure that any proposal voted on by the full Commission has the strongest possible legal foundation. A number of questions which are of great interest to us have already been raised to you by Michael Bradley of the Northeast States for Coordinated Air Use Management (NESCAUM) in his letter to William Rosenberg of July 29, 1992.

The OTC Stationary/Area Source Committee has been responsible for the OTC's investigations into interstate offsets; at this time, the Committee is working on NOx offset issues exclusively. Based on its work to date, the Committee has discussed many options, but has focused on one general approach to the two main statutory requirements for offsets, those being: 1. offsets must come from an ozone nonattainment area with an attainment classification at least as severe as the area in which the new major source or major modification will be located; and 2. offsets must have a beneficial air quality impact on the area in which the new major source or major modification will be located. This approach is presented below.

First, as long as the severity constraint was met, offsets would be allowed throughout the OTR. The basis for this principle is that Congress created the OTR as a single (and to date unique) air quality planning region, and arguably offsets meeting the required offset ratios anywhere in the OTR would by definition provide a beneficial air quality impact. Second, all moderate, marginal, unclassified , and attainment areas, as well as those with incomplete data, would be regarded as moderate areas for offset purposes. This is consistent with the Act's treatment of ozone transport regions. This means that new emissions from these areas

could obtain offsets from anywhere within the OTR, creating a sort of emissions "free trade zone." Similarly, new major sources or major modifications locating in serious areas could obtain offsets from any serious or severe area within the OTR, and those locating in severe areas could obtain offsets from any severe area within the OTR.

We are therefore requesting assistance from EPA to analyze the acceptability of this approach, as well as suggestions for addressing any inadequacies by three months from now. It is of utmost importance for the OTC to receive a response within this period of time to allow us the opportunity to consider your response as we prepare for our Annual Meeting, which will probably be held in either May or June. We appreciate any consideration of these issues you can give us, and as well as your continuing support of the OTC.

Sincerely yours,

Bruce S. Carhart
Executive Director

cc: All OTC Members
All OTC Stationary/Area Source Committee Members
Bill Becker, STAPPA/ALAPCO
Michael Bradley, NESCAUM
Jim Hambright, MARAMA

Attachment 5

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

MAR 31 1993

Mr. Bruce S. Carhart
Executive Director
Ozone Transport Commission
444 North Capitol Street, N.W.
Suite 604
Washington, D.C. 20001

Dear Bruce:

This is in response to your questions, raised in your December 30, 1992 letter to me, concerning the Ozone Transport Commission's (Commission) investigation of the possibility of a regionwide nitrogen oxide (NO_x) offsets trading program. The priority the Commission has given this program reflects the concern of its constituent States and industries in the Ozone Transport Region (OTR) that emissions reductions be achieved while minimizing the constraints on economic growth. As you know, the Environmental Protection Agency (EPA) shares this concern and has been evaluating a number of market-based and regional trading issues. Of course, we also share the Commission's desire that any such trading programs be both environmentally and legally sound.

Your letter expressed interest in the EPA's response to questions regarding market-based emissions trading programs raised in a July 29, 1992 letter from Michael Bradley of the Northeast States for Coordinated Air Use Management (NESCAUM) to William Rosenberg, former Assistant Administrator for Air and Radiation. The Agency is continuing to study the issues raised in the NESCAUM letter and intends to respond to the questions raised there in the near future.

In addition, your letter requested the EPA's views regarding specific elements of an approach the Stationary/Area Source Committee of the Commission has developed regarding an interstate offset system. Your letter identifies "the two main statutory requirements for offsets" generally as follows: (1) offsets must be obtained from an area with an equal or higher nonattainment classification as the area in which the new source is locating, and (2) offsets must have a beneficial air quality impact on the area in which the new source is locating. Under the Committee's approach, only the nonattainment classification constraint need be satisfied on a case-by-case basis. You reason that--because Congress created the OTR as a single and unique air quality

planning region--offsets anywhere in the OTR arguably "by definition provide a beneficial air quality impact." Also, under the Committee's approach, moderate, marginal, and incomplete/no data nonattainment areas, as well as attainment areas within the OTR, would all be considered moderate areas for purposes of offsets. You explain that these areas would thus constitute a "free trade zone" in the OTR, which you assert is consistent with the Clean Air Act's (Act's) treatment of ozone transport regions. Finally, you note that new sources in serious areas could obtain offsets from any serious or severe area in the OTR, and those locating in severe areas could obtain offsets from any severe area in the OTR.

The EPA's Office of Air Quality Planning and Standards has established a work group to address issues raised by the Committee's approach. The following are our preliminary conclusions.

Statutory Provisions

Section 173(c)(1) of the Act sets out the terms under which sources may trade offsets. Where the source reducing emissions to provide offsets is located in the same nonattainment area as the new source, no special conditions on trading apply. The sources may even be located in different States. Where the source reducing emissions to provide offsets is located in a different nonattainment area than the new source, two special conditions apply. Under section 173(c)(1)(A), the area in which the source is reducing emissions to provide offsets must have an equal or higher nonattainment classification as the area where the new source is locating. Under section 173(c)(1)(B), emissions from the area in which the source is reducing emissions must contribute to a violation of the national ambient air quality standards (NAAQS) in the area where the new source is locating.

Section 184(b) of the Act provides that stationary sources that emit or have the potential to emit 50 tons per year (tpy) of volatile organic compounds (VOC) shall be considered a major stationary source and subject to the requirements that would be applicable to it if the area were classified as a moderate nonattainment area. Under section 182(f), the plan provisions required for major VOC sources also apply to major NO_x sources. Section 182(b)(5) specifies that the offset ratio applicable to major sources in moderate areas is 1.15:1. New major NO_x sources (i.e., 100 tpy) in the attainment, incomplete/no data, marginal and moderate areas of the OTR must satisfy this offset ratio.

Nonattainment Classification for Offsets Purposes

We do not believe that moderate, marginal, incomplete/no data nonattainment areas, as well as attainment areas within the OTR, may be considered moderate areas for purposes of securing offsets. We recognize that sources in these areas are all subject to the requirements that would be applicable to them if the areas were classified as moderate nonattainment areas. Nonetheless, section 173(c)(1) by its terms provides that offsets must be obtained from an area of equal or higher nonattainment classification, and these areas have designated classifications under section 107 that govern. We believe that the general policy of section 173(c)(1)--to prevent offsets generated in less polluted areas from being used for new growth in more polluted areas even if contribution is demonstrated--applies equally in the OTR. We do not think emissions reductions in an attainment area can offset new growth in a designated nonattainment area consistent with section 173(c)(1).

Offsets Trading in Nonattainment Areas of the OTR

Section 173(c)(1) applies by its terms to offsets trading between designated nonattainment areas. As noted above, offsets may be obtained from any location within the same nonattainment area. If the sources are not in the same nonattainment area, however, the designation and contribution conditions of section 173(c)(1)(A) and (B) must be satisfied. Under (A), the offsets must be obtained from an area of equal or higher nonattainment classification. Under (B), contribution must exist.

We believe that section 173(c)(1)(B) authorizes the EPA to establish a reasonable contribution test, and that the Agency has broad discretion to determine the applicable test, so long as it is technically supportable. At this time, we do not believe it is technically feasible to model the NO_x emissions contribution for ozone for a single offset transaction. A more general contribution test must therefore be adopted. One possible test is that the new source might demonstrate that the source that is reducing emissions is within 2 days transport upwind of the new source location. Alternatively, the source that is reducing emissions might be constrained to be within a specified upwind distance from the new source, such as a default value of 200 kilometers. In the former case, the sources would bear the burden of this demonstration as part of the approval process for the trade.

We would welcome your comments on these possible contribution tests, as well as any suggestions for other potential tests. Of course, the test adopted for the OTR could have important implications for the test applicable in other nonattainment areas elsewhere in the country.

Offsets Trading in Attainment Areas of the OTR

The terms of section 173(c)(1) refer to nonattainment areas and contribution to a violation of the NAAQS, and therefore do not apply literally to offsets trading between designated attainment areas. The EPA has discretion to fill this gap, consistent with the spirit of section 173(c)(1),[1] the reasons new source review applies to sources in the attainment areas of the OTR under section 184(b),[2] and the policies reflected in the EPA's Emission Offset Interpretive Ruling, 40 CFR part 51, Appendix S.[3] In exercising this discretion, the EPA wants to provide a flexible approach that is consistent with the overall goals of the Commission, is environmentally sound, and legally supportable.

Applying these considerations to the unique circumstances of offsets trading in attainment areas of the OTR, our policy preference is to permit the States to allow offsets trading within those attainment areas without further limitations. The legal support for this approach rests on the purposes, structure, and technical assumptions underlying section 184(b). Congress included attainment areas in the OTR based on the presumption that they constitute a source of emissions that contributes to nonattainment in the OTR, subject to removal from the OTR under section 176A(a)(2) if the Administrator has reason to believe an area does not contribute. Contribution was not established in

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[1] The geographic restrictions of section 173(c)(1) appear to reflect Congress's intent that the emissions impact due to new growth be offset by emissions reductions that benefit the air quality where the new source is locating.

[2] Congress presumably included in section 184(b) controls on emissions in attainment areas within the OTR in order to address ozone violations in the OTR's nonattainment areas.

[3] The Offset Ruling was developed prior to the 1990 Amendments, and thus prior to the extension of the new source review offsets requirements to attainment areas, to the specification of offset ratios, and to the specific geographic limitations of section 173(c)(1). The Offset Ruling does, however, indicate that offsets should be obtained "within the broad vicinity of the proposed new source," and that offsets would be "acceptable if obtained from other areas that may be contributing to the ozone problem at the proposed new source location." The Offset Ruling further notes that "it is desirable to obtain offsets from sources located as close to the proposed new source as possible." This policy is consistent with the apparent intent of section 173(c)(1) to ensure that the emissions reductions offsets counteract the emissions impact that the new source will cause.

fact or degree for each attainment area included. Arguably, the same general approach could carry over when emissions are rearranged and reduced overall in the attainment areas through application of the offsets program. As overall contribution from attainment areas was sufficient to include them in the OTR without consideration of specific location, overall reductions in emissions from attainment areas should likewise be sufficient without consideration of specific location. In a sense, these areas might be viewed as constituting a single area for offsets purposes under this approach. Thus, ensuring that emissions reductions offsets counteract the emissions impact that the new source will cause in the OTR overall would also satisfy the policies of section 173(c)(1) and the offset ruling as applied to attainment area controls in the OTR. Further, it follows that any attainment area could obtain emissions offsets from any nonattainment area in the OTR without further limitations.

The EPA's policy preference is based, in part, on our recognition that the density of major NO_x sources is greatest in the western and southwestern areas of the OTR--areas generally upwind of most designated ozone nonattainment areas in the OTR. We expect that emissions reductions at existing facilities, to offset new growth in the OTR, would most often come from these upwind areas and thus, less frequently from downwind or too far upwind locations. The benefits of such trades are clearest when offsets come from nearby upwind sources. However, even when offsets come from downwind sources or sources that are very far upwind, the emissions reductions still benefit the overall OTR, even if they may not substantially affect the ozone nonattainment areas that the new source will impact.

There is, however, an alternative view that for offsets trading between designated attainment areas within the OTR, emissions from the area where the offsets are generated must contribute to a violation of the NAAQS in a nonattainment area that the new source will impact.[4] This alternative view incorporates both the implicit purpose of section 184(b) to protect downwind nonattainment areas as well as the provision of section 173(c)(1) that the local impacts of new growth be connected to offsetting emissions reductions. Under this approach, emissions reductions from downwind sources or from sources too far upwind could not be used as offsets. Such an alternative view could presumably be based on the same kind of contribution test as that applicable for trading in nonattainment

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[4]Similarly, if offsets are generated in a nonattainment area for a new source locating in an attainment area, the nonattainment area's emissions must contribute to a violation of the NAAQS in another nonattainment area that the new source will impact.

areas. We would appreciate further analysis and comments from the Commission or its constituent States regarding these two approaches concerning the relative costs of applying the contribution test, the relative environmental benefits, and the legal analysis. We are also receptive to considering any other approaches that you develop.

In any case, please note that sources locating in either ozone or nitrogen dioxide attainment areas of the OTR also must comply with the requirements of the prevention of significant deterioration (PSD) program. In certain limited cases where sources must limit ambient impacts on Class I areas or increments, if offsets secured in other areas do not sufficiently impact the area where the new source is locating, the new source may need to secure other reductions to satisfy these PSD concerns.

Beyond the policy issues discussed above, it is important to note that there are enforceability issues related to any interarea and/or interstate trading programs which will need to be satisfactorily resolved. As your program development progresses, we will be happy to work with you to identify and address these enforcement issues.

Please contact me if you have any questions or comments about these issues. After you have had an opportunity to study these conclusions with the Stationary/Area Source Committee and the Commission, we look forward to working closely with you to develop a specific program and to resolve any outstanding issues.

Sincerely,

John S. Seitz
Director
Office of Air Quality Planning
and Standards

Attachment 6

MEMORANDUM OF UNDERSTANDING
AMONG THE STATES OF THE OZONE TRANSPORT COMMISSION
ON INTRASTATE NOx EMISSION OFFSET TRADING PROGRAMS

WHEREAS new source review requirements of Title I of the Clean Air Act require NOx offsets of emissions for new major sources and major modifications in the Ozone Transport Region (OTR); and

WHEREAS the Ozone Transport Commission (OTC) wants to ensure that the jurisdictions of the OTC meet the statutory requirements of the Clean Air Act while enhancing the opportunities for economic growth and environmental protection in the OTR; and

WHEREAS it is desirable for new sources to have access to a ready supply of emission offsets to ensure the required emission reductions are more than equal to the emissions of the new sources; and

WHEREAS expanding the area of potential offsets should enhance both supply and accessibility of offsets for new major sources and major modifications; and

WHEREAS the OTR has been created by statute as a distinct air quality planning region for control of ground level ozone; and

WHEREAS offset programs can and must be designed with long term attainment and maintenance of the National Ambient Air Quality Standards in mind; and

WHEREAS the OTC recognizes the concept that a series of intrastate trading programs with common elements within the OTR can expand the creation of and the availability of offsets under certain conditions; and

WHEREAS the OTC members agree that each intrastate NOx emission offset trading program has the potential for creating greater air quality benefits than would occur in the absence of a NOx emission offset trading program;

THEREFORE, the OTC supports the development of intrastate NOx emission offset trading programs and policies that provide compatibility with the possible future development and implementation of an interstate NOx emission offset trading program; and

FURTHERMORE, the parties to this Memorandum of Understanding (MOU) agree that each member jurisdiction may engage in emission trading with other jurisdictions prior to the development of an OTC interstate NOx emission offset trading program consistent with the requirements of the Clean Air Act; and

FURTHERMORE, the parties to this MOU agree to continue to cooperate to make their individual offset programs compatible; and

FURTHERMORE, the parties to this MOU agree that to the greatest extent practicable their individual intrastate emission trading programs shall reflect the attached common elements.

Signed this 18th **day of** May, 1993 **by the following:**

CONNECTICUT: Timothy R. E. Keeney

DELAWARE: Gary A. Myers

DISTRICT OF COLUMBIA: _____

MAINE: Dean C. Marden

MARYLAND: Bob Perciasepe

MASSACHUSETTS: + Rudy Coxe

NEW HAMPSHIRE: Robert W. Varney

NEW JERSEY: Scott A. Weiner

NEW YORK: Thomas C. Jorling

PENNSYLVANIA: Catherine W. Cowan

RHODE ISLAND: Lonnie J. Mylee

VERMONT: Chuck Clarke

VIRGINIA: _____

Attachment 6, cont.

**Common Elements of a
NOx Emission Offset Trading Program**

The Ozone Transport Commission (OTC) member states[1] agree that intrastate NOx emission offset trading programs should result in greater air quality benefits and economic opportunity than would otherwise occur in the absence of a such a trading program.

1. Information - Creation of a common commodity, in this case emission reduction credits, will facilitate both intrastate and interstate trading programs in the Ozone Transport Region (OTR). Thus, the OTC members should require the submission of certain data elements on all applications for creation of emission reduction credits. The collection of certain common data will provide uniformity and consistency throughout the OTR and is an important step towards implementing an interstate trading program for emission reduction credits.

2. Calculation Procedure - Another step towards developing a uniform and consistent emission reduction credit trading program is to create a set of common procedures for quantifying the amount of an emission reduction credit. The OTC member states should use the same calculation procedures so as to provide certainty in the amount of emission reductions that an emission reduction credit represents. The OTC member states should recognize the initial amount (prior to adjustments and certification) of an emission reduction credit throughout the OTR if such calculation procedures are used.

3. Certification Process and Regional Registry - The third element in establishing a uniform and consistent emission reduction credit trading program is the establishment of a common certification process. The OTC member states should use a common certification process which will ensure the integrity of the emission reduction credit and will provide credibility to the trading program. The common certification process should include the following.

- Certification of emission reduction credits should be subject to public comment.

- All certified emission reduction credits should be federally enforceable.

- The certificate for emission reduction credits should include at a minimum, certain common elements.

Adjustment of emission reduction credits for uncertainty should be made by the state prior to certification. Once emission reduction credits have been certified, other OTC member states should not further adjust the amount of the certified credits,

except to account for new rules which reduce allowable emissions after certification.

A regional registry should act as a regional clearinghouse. Information on all emission reduction credits certified in the OTR should be maintained and made available to all parties upon request. The regional registry should not have independent approval responsibility. It should act as a common source of information and track and record the use of emission reduction credits to ensure that there is no double counting of the credits.

4. Nature of NOx Emission Reduction Credits - The OTC members agree that NOx emission reduction credits are not property rights, but are limited authorizations to emit NOx. The status of NOx emission reduction credits is deemed to be consistent (at the state level) with the status of Allowances under Title IV of the Clean Air Act, as amended[2]. Further, the OTC members wish to emphasize the right of each state to establish a program to create emission reduction credits as described in this document.

5. Shutdowns - NOx offset credits created by 1) the shutdown of a facility, or 2) the shutdown of sources or equipment within a facility may be limited by intrastate program rules. Such program rules may allow each state to either control how and where persons use NOx offset credits or to retain credits for other uses by the state. This policy encourages the creation of NOx offset credits that are the result of increased control of emissions, pollution prevention initiatives, raw material changes and other actions that go beyond existing regulatory requirements, rather than emission reductions resulting from production adjustments or curtailment.

6. State-controlled or State-banked Emission Reduction Credits - The members of the OTC acknowledge that each state has its own State Implementation Plan for air quality, and that each state has its own unique strategy, consistent with the overall goals of the OTC, to address the ozone problem. Individual state policies may involve varying degrees of participation by each state in market-based programs for the control of ozone. With respect to the ability of member jurisdictions to generate emission reduction credits, member jurisdictions have the same authorities and are subject to the same limitations as other entities. A member jurisdiction may use the emission reduction credits generated within their jurisdiction to foster economic development or to make reasonable further progress (RFP) toward attainment of the National Ambient Air Quality Standard (NAAQS).

7. Non-prohibition of Interstate Trading - Members of the OTC should craft their NOx offset banking and trading rules so that each state's intrastate trading rules do not prohibit interstate trading of emission reduction credits.

8. Standard Principles - The rules of the OTC member states should be based on the following principles:

- Any generation, exchange, or use of emission reduction credits shall be conducted in accordance with applicable guidelines promulgated by the United States Environmental Protection Agency (EPA) (see attachment).

- Emission reduction credits may be used for any purposes authorized under the rules of the receiving jurisdiction, subject to the guidelines referenced above.

9. Amount of Emission Reduction Credits Over Time - At the time of their certification, the OTC member states should fix the quantity of emission reduction credits except as provided for below. Any member jurisdiction may, at such time and in accordance with its rules, retain a portion of the credits for its own use. For credits created from the shutdown of sources, the member jurisdiction may retain the entire quantity for its use, either in full upon their creation or through reducing the quantity held by the generating source over time.

Prior to the use of emission reduction credits, the member jurisdiction in which the generating source is located should adjust the quantity of the emission reduction credits to account for the effect on the generating source of rules adopted subsequent to the generation of the credits.

In addition, as a strategy to make reasonable further progress (RFP) toward the National Ambient Air Quality Standard (NAAQS) for ozone, a member jurisdiction may adopt a policy of decreasing, by a percentage per year or other time period, the quantity of all the certified emission reduction credits. Such a decrease would not apply to credits that have been used or approved for a specific use.

10. Intersector Trading - Emission reduction credits generated from reductions in emissions from mobile, off-road, and area sources shall be eligible for interstate trading, so long as those reductions are beyond any required pursuant to federal laws or regulations and applicable provisions of a State Implementation Plan (SIP).

In cases where the emission reduction credits are from mobile, off-road, and area source reductions of limited duration,.the emission reduction credits shall be applied against corresponding temporary emission reduction needs.

11. Enforcement - Enforcement by the OTC member jurisdictions shall be based on the following principles.

- Any emission reductions utilized for emission reduction credits that are traded between member jurisdictions or

between nonattainment areas, or both, shall be federally enforceable.

- Interstate trading of emission reduction credits and the appropriate use of credit traded between states/districts shall be subject to enforcement by the United States Environmental Protection Agency (EPA).

- A member jurisdiction shall be responsible for sources located within its jurisdiction for enforcing any emission reductions used to generate emission reduction credits.

- A member jurisdiction shall be responsible for new and altered sources being constructed in the jurisdiction, and for enforcing the appropriate application of emission reduction credits against the emission increases from the new and altered sources.

End notes:

1. Throughout this paper reference to "states" or OTC member "states" includes reference to the District of Columbia

2. See 42 U.S.C. 7651b(f), (Pub. L. 101-549) CAAA, Title 4, Sec. 403 (f).

Attachment

EPA Guidance for Banking and Trading

- Emissions Trading Policy Statement (Federal Register, Thursday, December 4, 1986, pp. 43814-43860).

- Economic Incentive Rules (proposed).

- Guidance for Mobile Emission Credit Generation by Urban Buses (proposed).

- Guidance for Mobile Emission Credit Generation by Clean Fuel Fleets and Vehicles (proposed).

- Guidance for the Implementation of Accelerated Retirement of Vehicles Program (proposed).

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET HARTFORD, CONNECTICUT 06106

Timothy R. E. Keeney
Commissioner

1993 OCT 14 AM 10: 32

October 8, 1993

Honorable Joseph I. Lieberman
Subcommittee Chair
Clean Air and Nuclear Regulation
Committee on Environment & Public Works
United States Senate
Washington, DC 20510-6175

Honorable Alan K. Simpson
Ranking Member
Clean Air and Nuclear Regulation
Committee on Environment & Public Works
United States Senate
Washington, DC 20510-6175

Dear Senators Lieberman and Simpson:

As you requested in your September 23, 1993 letter, I am responding to Senator Simpson's questions as a follow-up to my August 3, 1993 testimony.

Questions 1 and 3 relate to the costs of implementing required elements of the Clean Air Act. The State Implementation Plan is a series of air pollution control strategies designed to comply with the federal Clean Air Act. As such, the Plan is continuously being amended with analyses, commitments, and regulations that provide the framework for Connecticut to implement the federal requirements. In fiscal year 1993, Connecticut amended its State Implementation Plan with the following additions:

- Requirements for detailed annual reporting (emission statements)
- Requirements for a Small Business Assistance Program
- Commitment to implement transportation control measures
- Commitment to offset CO emissions caused by VMTs that exceed forecasts
- Commitment to implement enhanced vehicle inspection and maintenance
- Commitment to employee commute option for a portion of the State
- Request to opt out of clean fuel fleets and request to substitute low emission vehicles in lieu thereof
- Revised particulate matter standard
- Narrative explaining Stage II vapor recovery and requirements for the program
- Requirements for oxygenated gasoline

State Implementation Plan development is predominantly the responsibility of the Air Management Bureau's Planning & Standards Division. In FY93, the Bureau's budget was $7.5 million with $3.5 million or approximately 47% of the overall budget supported by Environmental Protection Agency (EPA) grants. The federal share of the budget will decline as the program grows because EPA has limited program support to level funding. The Bureau's budget will grow to $11.5 million in fiscal year 1994 and $15.6 million in 1995 as additional state funding mechanisms begin to generate the revenue needed to support the program. This equates to 30% and 22% EPA grant support for 1994 and 1995. State Implementation Plan activities consumed approximately 27% of the Bureau's budget in 1993 or $2 million. In 1995, the anticipated planning related expenditures will be $3 million. After finalizing attainment planning activities, the State Implementation Plan related expenditures will decrease and the greater part of the state program effort will be directed to implementing the plans and assessing progress.

State Implementation Plan activities include developing control strategies to reach attainment for particulate matter, carbon dioxide, and ozone. The particulate matter nonattainment area is small geographically and caused by a localized situation. Consequently, Connecticut's implementation costs for particulate matter cannot be used to estimate the national cost of attainment. Compliance with the first phase of NO_x RACT requirements is estimated to be $500 per ton annually in Connecticut. Volatile organic compound control strategies under consideration for the Reasonable Rate of Progress Plan (15% Plan), include gasoline controls and VOC RACT. The average cost of VOC control strategies is estimated to be $1300 per ton annually with VOC RACT estimated to be $5000 per ton annually.

The 15% Plan is based on the 1990 base year inventory as required by the EPA. Although other data is available, the States bear the burden of collecting all the data, performing quality assurance/quality control checks on the data, and must base their plans on a common and consistent data base. Resources spent on additional data bases are resources not available for other program requirements. Of far greater concern to States trying to plan for the future is the lack of availability of guidance and data from the EPA on federally required program elements. The 15% Plans are dependent upon CTGs (control technology guidelines) that EPA is required to develop. These guidelines have not been promulgated in a timely fashion so planning and quantification of the reductions from these programs is impossible.

Connecticut has seen reductions in the motor vehicle fleet and vehicle miles travelled (VMTs) growth that may be a function of the economic recession in the northeast. Reductions in industrial emissions based on the economic climate are likely to be attributed to decreased production and pollution prevention driven by industry cost cutting initiatives. Sound long-term planning for air quality cannot be based on the economic recession because the conditions are temporary and the economy will rebound at some point in time. The recession has had a significant impact on industry's ability to comply and remain competitive. An example of this is Porce-len, a Connecticut company that applies architectural coatings for high-rise building construction. Requiring "containment" to achieve compliance renders the operation uneconomical. When faced with the requirement to comply, the company will relocate to an area south of the northeast ozone nonattainment area. This differential in air quality standards compounds the economic impact of the recession on the northeastern states.

Should you have additional questions, I will gladly provide any information we have available.

Sincerely,

Timothy R.E. Keeney
Commissioner

TESTIMONY OF BARRY R. WALLERSTEIN, ASSISTANT DEPUTY EXECUTIVE OFFICER, SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, DIAMOND BAR, CALIFORNIA

This presentation provides a status report on the South Coast Air Quality Management District's efforts to implement Title I and other nonattainment provisions of the federal Clean Air Act in the South Coast Air Basin. It has been structured to provide background information on regional air quality concerns and regulatory activity, and on progress toward meeting November 1992 and 1993 submittal requirements, as well as to respond to other issues contained in the July 26, 1993, invitation letter from the Subcommittee on Clean Air and Nuclear Regulation.

Introduction

The federal Clean Air Act Amendments (CAAA) of 1990 and their proper implementation are vital to achieving healthful air quality in Southern California. The South Coast Air Quality Management District (District) commends and congratulates the Subcommittee for its role in the development and continued oversight of the CAAA. As local, state and federal officials implement the CAAA's may provisions, continued participation by Congress helps to ensure that expeditious progress will be made in combating air pollution. Since air pollution is Southern California's most significant environmental problem, the importance of the CAAA and related state laws cannot be overstated.

Many lessons have been learned from the first two and one-half years of implementation of the CAAA in Southern California. Most important of these is that the CAAA can be successfully implemented. It has also become increasingly clear that our region's ability to carry out the provisions of the CAAA is largely dependent on a partnership between the implementing agencies. Thus, it is crucial that the U.S. Environmental Protection Agency (EPA) provide timely guidance and implementation of federal emission control measures.

Background

The South Coast Air Basin ("Basin") is a 6,600-square-mile region in the metropolitan Los Angeles area of Southern California. The Basin is comprised of the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties and all of Orange County. The region's population currently exceeds 13 million persons, or about one out of every 20 Americans. The South Coast Air Quality Management District is the regional agency with primary responsibility for air pollution control in the region.

While control efforts have substantially reduced regional air pollution levels, the area still suffers from the worst air quality in the nation. The Basin is designated under the Clean Air Act as an extreme nonattainment area for ozone, a serious nonattainment area for carbon monoxide and fine particulate matter (PM_{10}), and is the only remaining nonattainment area for nitrogen dioxide (Exhibit I). Measured levels of each of these pollutants are either the highest or among the highest found anywhere in the United States. In addition, the region generally experiences a greater number of days exceeding these standards than do other nonattainment areas. For example, in 1992, the federal ozone standard was exceeded on 118 days, which was thirteen times more frequent than any area outside of California. Amazingly, 1992 was the cleanest year on record during the last forty years with respect to Basin air quality.

The region's air pollution control program was formally initiated in 1948 with adoption of a regulation to reduce emissions from open burning of refuse and sludge. The first motor vehicle pollution regulation was adopted in 1963 to control crankcase emissions. The region's existing air pollution control regulations for mobile and stationary sources are generally regarded as the most stringent set of emission controls anywhere in the United States.

The first Air Quality Management Plan (AQMP) for the Basin was adopted in 1979 pursuant to federal Clean Air Act requirements. The Plan has undergone major revisions on three occasions subsequent to the original adoption: October 1982, March 1989, and July 1991. The last of these revisions was in response to mandates specified in California state law. One of the key conclusions reached in each of these Plans is that all identifiable emission controls for stationary and mobile sources are needed to achieve federal air quality standards.

Thus, the region has a long history in implementing federal and local planning and regulatory programs to reduce air pollution. Even with the success to date, the region still has further to go to achieve all federal ambient air quality standards

than any other nonattainment area. Given these facts, the District is in a position to offer a unique perspective on issues related to state and local implementation of Title I and other nonattainment provisions of the federal Clean Air Act.

Issues/Questions

The Subcommittee has requested information relative to several issues/questions. The following provides District staffs comments on these items.

1 Status of November 1992 SIP submittals

Exhibit II lists the SIP submittals required between May 1991 and November 1993, including those due on November 15, 1992. While the CAAA prescribed an aggressive schedule for SIP submittals, the South Coast Air Quality Management District and California Air Resources Board have a good record in making such submittals in the allotted time frame. Specifically, fourteen of the fifteen SIP submittals required under the 1990 CAAA by November 1992 for the South Coast Air Basin were provided. The remaining item, enhanced vehicle inspection and maintenance, is actively being developed with two bills pending before the state legislature. Thus, the South Coast Basin has been able to comply with all of the key actions required under Title I with one exception which we hope to correct in the near future.

It is important to note that the region's sophisticated Air Quality Management Plans and stringent regulations provided a foundation upon which to make the prescribed submittals. These materials are publicly available and may possibly serve as a partial template for current and future submittals in other nonattainment areas.

The content of seven of the submittals specifically due to EPA on November 15, 1992 which we believe to be of special interest is outlined below.

Carbon Monoxide Plan Submittal

The CAAA require all states containing an area designated as nonattainment for carbon monoxide to submit an attainment plan by November 15, 1992. The plan must provide for attainment of the primary carbon monoxide standard as expeditiously as practicable but no later than December 31, 2000. To meet these requirements of the CAAA, the District prepared a federal carbon monoxide attainment plan derived from the 1991 AQMP. Additional carbon monoxide control measures, contained in the 1991 AQMP but not needed to demonstrate attainment, are presented as contingency measures.

RACT/CTG Submittal

The CAAA also require a SIP revision specifying RACT for major sources by 1995 and for those sources for which EPA has issued a CTG (Sec. 182(b)(2)). The District's existing regulations for control of oxides of nitrogen and volatile organic compounds (VOC) have been submitted to EPA. These include regulations specifying RACT for boilers, heaters, internal combustion engines, power plants, large turbines, and all major coating and solvent use activities. In each case, the District regulation is at least as stringent as EPA's existing RACT determination or CTG guidance. A further submittal will be forwarded to EPA upon receipt of additional CTG guidance.

Emissions Statement Submittal

The CAAA require a SIP provision which compels the owner or operator of each stationary source of oxides of nitrogen or volatile organic compounds to provide an emissions statement. The requirement may be waived for any class or category of stationary sources which emits less than 25 tons per year of volatile organic compounds or oxides of nitrogen if the State, in its submissions, provides an inventory of emissions from such class or category of sources. The District's fee rules specify emission reporting requirements and annual fees based on emissions. Thus, these rules fulfill the requirements of Section 182(a)(3)(B) for those sources filing an emission report and have been submitted to EPA as the applicable SIP revision. For the remaining sources, emission inventory estimates are prepared by District staff using EPA-approved methodologies.

Small Business Assistance Program Submittal

Under the CAAA, each state must adopt as part of the SIP, a small business stationary source technical and environmental compliance assistance program, including a state office ombudsman, mechanisms for collecting information and providing for lawful cooperation among such sources, assisting them with pollution prevention,

accidental release detection/prevention and permit processes, and referrals to qualified environmental auditors (Sec. 507(a)).

The California Air Resources Board has submitted a SIP revision on behalf of the State, including regulations, showing compliance with these requirements. In addition, the District has been a national leader in developing small business assistance programs. These programs include a multi-million dollar loan guaranty program for emission controls and on-site consultation regarding available control equipment and permit requirements.

Average Vehicle Ridership Programs Submittal

The CAAA require a SIP revision pursuant to EPA guidance which specifies that employers of 100 or more persons increase the average vehicle ridership (AVR) for commuting employees by 25 percent above the average AVR in the area at the time of submission. AVR targets may vary within the area and must be met within 4 years after submission (Sec. 182(d)(1)(B)).

District Regulation XV, Trip Reduction/Indirect Source, contains a set of rules directed at increased average vehicle ridership. This regulation was initially adopted in December 1987 and has been amended on a number of occasions to streamline requirements. The cornerstone provision of the rule is the requirement for employers with 100 or more employees to prepare and implement incentive-based plans to achieve a specified AVR for the worksite. The overall effect of Regulation XV will be to increase AVR by more than 25 percent. The provisions of Regulation XV are therefore consistent with the requirements of Section 182(d)(1)(B) and have been submitted to EPA as the applicable SIP revision.

Vehicle Miles Traveled/Transportation Control Measure Submittal

The CAAA require a SIP revision which includes sufficient transportation control measures (TCMs) to offset growth in vehicle miles traveled (VMT) to help achieve annual emission reduction targets (Sec. 182(d)(1)(A)). EPA is allowing California nonattainment areas to take credit for the State's on-road motor vehicle pollution control requirements that go beyond federal requirements in demonstrating compliance with this requirement. When such advanced controls are taken into account, analysis shows that there will be no growth in emissions over the baseline condition. The California Air Resources Board has provided EPA with a VMT forecast that demonstrates this phenomenon and serves as the applicable SIP submittal.

New Source Review Ozone Submittal

The CAAA set forth requirements pertaining to New Source Review (NSR) of applications for installation of new and modified equipment (Sec. 182(a)(3)(B)).

For example, the SIP submittal must require specified "emission offset" ratios and must require new and modified sources to employ control technologies' meeting the "Lowest Achievable Emissions Rate." The District's existing New Source Review Program, Regulation XIII, which was adopted in June 1990, exceeds these requirements and was previously forwarded to EPA as a SIP submittal.

2 Status of November 1993 SIP submittals

Five additional SIP submittals are required by November 15, 1993 for the South Coast Air Basin. These items are also listed in Exhibit II along with their current status. Preparation of each of these submittals is well underway and the District staff fully expects to submit each item to EPA by the prescribed deadline. The District staff believes that the two most significant items are the 15% VOC emission reduction plan and the Title V operating permits program.

Relative to demonstrating a 15% reduction in VOC emissions between 1990 and 1996, a draft SIP revision has been prepared and is undergoing internal agency review. Analysis to date indicates that the 15% reduction requirement can be met in the South Coast Air Basin through control measures contained in the region's 1991 Air Quality Management Plan, California's motor vehicle pollution control program, and applicable reformulated gasoline requirements. The draft Plan also concludes that the 3% per year post-1996 reduction requirement is achievable in the Basin. The current schedule for completion calls for an August public workshop and September or October 1993 public hearing for final approval.

Relative to the Title V operating permit program, the District has prepared draft rules which are undergoing public review and will be recirculated for final review in September, with adoption scheduled for October 8, 1993. The District has some

disagreements with EPA over the interpretation of Title V requirements, but remains hopeful that these issues will be resolved through ongoing discussions in the EPA approval process. Of key concern is the need for EPA to recognize and allow incorporation into Title V permits the variances which sources are able to obtain under State law in cases of emergency and conditions beyond the reasonable control of sources. EPA's Title V regulations presently require the permit to include a "breakdown" defense to enforcement action which is similar in purpose to the State law variance program. The District hopes EPA will be able to recognize the variance program as part of its Title V submittal.

3 Extent to which Title I requirements are being implemented through pollution prevention measures

Pollution prevention measures are an important component of the District's attainment strategy. These measures include more efficient spray guns, enclosed spray gun cleaning units which recycle cleaning solvents, chillers on solvent cleaning tanks, good handling practices for solvents, aqueous cleaners, and water-based inks and coatings. To further support implementation of such controls, the District's Technology Advancement Office directs an internationally recognized program of public-private partnerships to develop, demonstrate and commercialize progressively lower-emitting technologies and alternative fuels.

Assisted by a Title I, Section 105 grant to Region IX, the District is in the process of meeting a pollution prevention objective which will fill a perceived gap in emission regulation. This gap includes a need for impartial air pollution research and demonstration, small business compliance assistance, and pre-certification of consumer and industrial products for compliance with air quality rules.

In addition to instituting technology-based measures, the District is also active in the development of transportation control measures and pollution prevention guidance and media outreach.

4 Whether EPA has met its obligations to issue guidance and federal measures under Title I and II in a timely and adequate manner

Prominent among the EPA's responsibilities under the CAAA are the issuance of guidance documents and the adoption of regulations to control emissions from sources solely within federal jurisdiction.

Relative to the issue of guidance, EPA has missed several deadlines specified in the CAAA. While this has not created any insurmountable problems at this time, further delays in guidance (e.g., conformity, CTGs) could adversely affect implementation of the CAAA in the South Coast Air Basin. In addition, it is of critical importance that the EPA make full use of the flexibility intended by Congress in the CAAA when preparing guidance documents and reviewing SIP submittals. Section 100(k)(4)—Conditional Approval, for example, must apply to the review of control measures contained in SIP submittals for the South Coast Air Basin. Otherwise, it will be infeasible to craft an approvable attainment plan since all measures would have to be in regulatory form at the time of submittal instead of within one year of conditional approval.

The other major issue, the need for EPA action to control emissions from sources within its sole jurisdiction, is of equal importance. Every major air quality analysis conducted of the South Coast Air Basin over the last decade has revealed that all feasible emission controls are needed for ozone attainment. In fact, the current AQMP calls for full implementation of known technology (Tier I), advancement of known technology (Tier II), and technological breakthroughs (Tier III) as the overall control strategy. Thus, the region's ability to reach attainment is wholly dependent on EPA's success or failure at controlling emissions from "federal" sources. These include the as-yet relatively uncontrolled emissions from trains, ships, planes, and internal combustion engines within its jurisdiction. As a matter of equity and fairness to local businesses that may otherwise have to assume a disproportionate part of the clean-up effort, it is imperative that the EPA make a serious effort to control emissions from these sources. Absent such an effort, the citizens of South Coast Air Basin (5% of all Americans) will continue to be subjected to unhealthful air quality for an extended and unnecessary time period.

Finally, EPA has proposed regulations on some internal combustion engines pursuant to the authority granted EPA under Title II of the CAAA, which may extend to Title I sources under a certain size. The District strongly supports the interpretation that simply because a source is movable does not change its classification as stationary. However, EPA has proposed to define engines under a certain size as "nonroad" engines even where they are clearly stationary engines and in some cases are

already regulated by the District. Any action which would potentially preempt the District from regulating sources which it already permits and for which the District has adopted strict emissions limitations would be counterproductive. Moreover, since District regulations are more stringent than the proposed EPA regulations and emissions from these sources are critical, the result is a significant loss in the amount of emission reductions for the District.

Conclusion/Recommendations

The South Coast Air Quality Management District has made a major commitment to implement the 1990 federal Clean Air Amendments. While the task at hand is challenging, it is achievable and will produce substantial public health benefits. With the help of the EPA, California Air Resources Board and other parties, healthful air quality can be restored to Southern California.

At the federal level the following actions would be of great assistance in achieving the objectives of the 1990 Clean Air Act Amendments:

- Expeditious adoption of emission control requirements for pollution sources solely within EPA's jurisdiction;
- More timely issuance of Guidance called for under the CAAA;
- Reasonable, but stringent, interpretation and implementation of the CAAA, including the appropriate use of Section 110(k)(4); and
- Avoidance of any unnecessary preemption of State and local District regulations which are at least as stringent as RACT, such as in the area of nonroad engines.

Finally, it is critical that the Subcommittee continue congressional oversight through hearings such as this on a periodic, but regular, basis to monitor the implementation status of the CAAA.

Exhibit I

Maximum Pollutant Concentrations
South Coast Air Basin

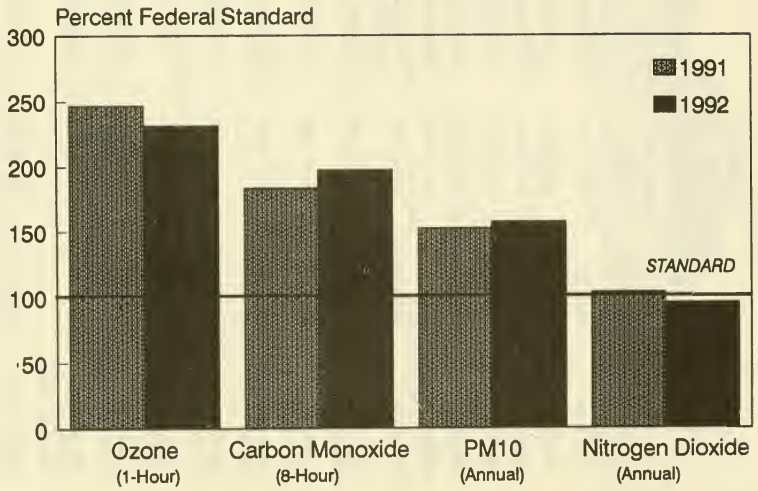


EXHIBIT II

SOUTH COAST AIR BASIN

CLEAN AIR ACT SIP REVISIONS/SUBMITTALS 1991 TO 1993

SUBMITTED	APPLICABLE SECTION(s)	CAAA DEADLINE	CURRENT STATUS
RACT Fix-ups	182(a)(2)(A)	May 15, 1991	Completed; EPA review underway
PM10 Plans	189(a)(2)(A)	May 15, 1991	Completed; EPA review underway
NO2 Plan	191(a)	May 15, 1992	Completed; EPA review underway
NSR-PM10	189(a)(1)(A)	June 30, 1992	Completed; EPA review underway
NSR-Ozone	182(a)(2)(C)	Nov. 15, 1992	Completed; EPA review underway
CO Plans > 12.7ppm	187(b)	Nov. 15, 1992	Completed, EPA review underway
RACT/CTGs	182(b)(2)(A-C)	Nov. 15, 1992	Partially completed; awaiting EPA guidelines
Emission Statements (Rule to Require)	182(a)(3)(B)	Nov. 15, 1992	Completed; EPA review underway
Small Business Assistance Program	507(a)	Nov. 15, 1992	Completed; EPA review underway*
Trip Reduction Programs	182(d)(1)(B)	Nov. 15, 1992	Completed; EPA review underway
VMT Forecast/ Offsetting TCMs	182(d)(1)(A)	Nov. 15, 1992	Completed; EPA review underway*
Emissions Inventory Actual & Projected	182(a)(1)	Nov. 15, 1992	Completed; EPA review underway*
Gasoline Vapor Recovery	182(b)(3)	Nov. 15, 1992	Completed; EPA review underway
California Pilot Test Program (Clean Fuel Vehicle)	249(c)	Nov. 15, 1992	Completed; EPA review underway*
Enhanced Vehicle I & M	182(c)(3)	Nov. 15, 1992	State legislation pending

* Submittal made by California Air Resources Board on behalf of the entire state.

EXHIBIT II (Continued)

SOUTH COAST AIR BASIN

CLEAN AIR ACT SIP REVISIONS/SUBMITTALS 1991 TO 1993

SUBMITTED	APPLICABLE SECTION(s)	CAAA DEADLINE	CURRENT STATUS
Enhanced Monitoring Program (PAMs)	182(c)(1)	Nov. 12, 1993	Draft program plan completed
Clean Fuels or Advanced Technology for Boilers	182(e)(3)	Nov. 15, 1993	Draft rule completed
Title V Operating Permit Program	502(d)	Nov. 15, 1993	Draft rule completed
RFP Demonstration (15% VOC Reduction)	182(b)(1)(A)(i)	Nov. 15, 1993	Draft plan completed
Annual Update to VMT Forecast and Estimated Actual VMT for CO	187(a)(2)(A)	Nov. 15, 1993	In progress**
Contingency Measures for Ozone; Enforceable Commitment for Annual Tracking Program	172(c)(9) 182(c)(9)	Nov. 15, 1993	In progress
First Annual Emissions Statement	182(a)(3)(B)(ii)	Nov. 15, 1993	In progress

** Submittal being prepared by Southern California Association of Governments, designated MPO for the region.

South Coast
AIR QUALITY MANAGEMENT DISTRICT
21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

October 20, 1993

The Honorable Joseph I. Lieberman, Chairman
Subcommittee on Clean Air and Nuclear Regulation
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510-6175

Subject: Follow-up Questions on Issues Associated with Implementation of the Clean Air Act

Dear Senator Lieberman:

It was a pleasure providing information to the Subcommittee on Clean Air and Nuclear Regulation on August 3, 1993 regarding the South Coast Air Quality Management District's (District) efforts to meet the requirements of the Clean Air Act. The following are responses to follow-up questions from Senator Alan Simpson requested in your letter dated September 23, 1993.

1. **What has it cost to put together your state implementation plans, including obtaining EPA approval? How much of this cost is born by EPA through state grants?**

Over 85 percent of the District's activities are related to meeting either federal or state Clean Air Act mandates. Attachment I compares budget resources and costs associated with the development of state implementation plans (SIPs) over the past five fiscal years. "FTE" stands for full-time equivalent position; "Program $" includes total cost (contracts, labor, equipment). A description of SIP program categories follows the budget summary in this attachment. Attachment II shows the amount of EPA grant monies that has been spent on the development and implementation of SIPs over the last five fiscal years. Relative to the District's overall budget, the EPA grant monies represent less than two percent of the total budget.

In evaluating SIP costs, it is essential to keep in mind the severity and extent of the ozone air quality problem that faces Southern California. As you are aware, the South Coast Air Basin (Basin) is the only ozone nonattainment area designated as

"extreme." The District's jurisdiction covers over 6000 square miles and includes a population of over 14 million people. Over 125 emissions reduction control measures are identified in the 1991 Air Quality Management Plan (AQMP) for the South Coast Air Basin and are to be implemented over the next ten years in order to achieve the federal ozone air quality standard.

Because of the severity of the Basin's air quality problem, the development of SIPs is much more complex than for any other region. For example, measured levels of ozone, carbon monoxide, nitrogen dioxide and fine particulate matter (PM10) are either the highest or near the highest found anywhere in the United States. The development and testing of potential attainment strategies has necessitated the use and advancement of state-of-the-art air quality models.

In addition, the State of California has adopted regional air quality planning requirements that in many cases go beyond those set forth in the federal Clean Air Act. These include more rapid schedules for reducing air pollutant emissions, populational exposure reduction mandates, and specification of best available retrofit control technology requirements.

Thus, the Congress and California Legislature have significantly increased the requirements guiding the development of the Air Quality Management Plan in recent years. These actions were needed to better protect public health and are cost-effective when compared to the monetary costs of damage caused by air pollution.

In acknowledging the stringency of the California Clean Air Act requirements and the aggressive stance of regional rules and regulations, it is also important to note that the Basin is one of the few areas showing a decrease in man-made emissions and significantly cleaner air quality in recent years.

As the attachments to this letter describe in greater detail, the District has spent over the last three years, on average, about $6.5 million to comply with federal and state air quality planning requirements. This figure includes expenditures on efforts related to obtaining EPA approval. The EPA contribution through monetary grants is about $1.2 million per year. Due to budgetary constraints, we do not expect any significant increase in our expenditure or in the EPA contribution in the near term.

Such planning costs should be viewed in the context of the following parameters: (1) our region has the worst air quality in the nation, (2) one in every 25 Americans lives in the region, (3) the attainment strategy requires the use of current and future low-emission technologies and clean fuels, and (4) the Air Quality Management Plan addresses both federal and California requirements. It is also important to

note that the techniques and strategies developed for Southern California are directly applicable, in many cases, to other nonattainment areas. Thus, other nonattainment areas should be able to borrow measures from our Air Quality Management Plan to reduce their planning costs.

2. **When you are preparing your 15 percent reduction plan to be submitted in November, what is the most recent data you will have at your disposal? 1991? 1992? Does it make it hard to plan for the future when you may be working with two- or three-year-old data?**

The Clean Air Act requires the use of 1990 data as the base year for planning purposes. As such a 1990 volatile organic compounds (VOC) emission inventory has been used to prepare our 15 percent reduction plan. For the 1996 projected baseline inventory, we took into consideration emission reductions from rules and regulations adopted between 1990 and the end of 1992. However, the 1990 mobile source emissions are based on older, but best available, vehicle use data contained in the 1991 AQMP. Vehicle use data are currently under revision and an update will be provided in the 1994 Federal Attainment Plan for Ozone.

Although we are generally using data which may be one to two years old, the data used represents the best available information and is suitable for planning purposes. Moreover, the plan development process is a dynamic one which allows for periodic updates or revisions. Under California law, the District must update its Air Quality Management Plan every three years. The next update is due by December 31, 1994. To date, we have not significantly altered the basic control strategies to achieve ambient air quality standards even though the technical information is continually updated.

3. **What have been the costs associated with implementing these plans? Do you have any actual data on the costs per pound of VOCs, nitrogen oxides, or particulate matter removed?**

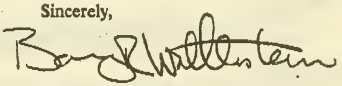
Attachment I contains the costs associated with the implementation of the AQMP. This includes rule development, enforcement and permitting activities. As described under the response to Question 1, the costs are associated with implementing both federal and state mandates.

California law requires that every new regulation that the District adopts be evaluated in terms of potential socioeconomic impacts. Attachment III summarizes the estimated costs per ton of pollutant removed for rules that have been adopted

from 1990 to 1992. In addition, the cost-effectiveness of the majority of control measures from the 1991 AQMP is also included in this attachment. As mentioned above, the cost-effectiveness values reported in Attachment III do not reflect air regulations adopted by the state or other agencies. For example, California's Low Emissions Vehicle (LEV) Program has an estimated cost-effectiveness between $2000 and $6000 per ton depending on the type of fuel used.

I hope the above responses and the attached material sufficiently fulfill Senator Simpson's request. Please feel free to have the Subcommittee staff contact me if there are any further questions regarding issues related to the implementation of the Clean Air Act in Southern California.

Sincerely,



Barry R. Wallerstein, D.Env.
Deputy Executive Officer
Planning and Information Management
(909) 396-3131

Attachments (3)

cc: James M. Lents

ATTACHMENT I

PROGRAM COST BUDGETED by Fiscal Year

	1989-90	1990-91	1991-92	1992-93	1993-94
SIP DEVELOPMENT					
PLANNING					
FTE's	42.7	63.6	58.4	61.6	45.5
Program $	$3,775,238	$7,109,055	$6,897,351	$7,427,566	$5,345,240
SIP IMPLEMENTATION					
RULE ENFORCEMENT					
FTE's	317.5	346.9	348.7	295.6	266.1
Program $	$25,618,407	$24,683,290	$27,192,142	$27,881,705	$23,585,523
PERMITTING					
FTE's	247.2	275.8	250.7	187.0	201.8
Program $	$16,102,152	$18,307,872	$16,318,240	$12,998,729	$13,607,715
RULE DEVELOPMENT					
FTE's	46.2	52.6	51.7	52.4	66.5
Program $	$3,436,647	$4,261,275	$5,211,984	$4,173,518	$6,282,519
TECHNICAL SUPPORT					
FTE's	88.1	89.3	94.2	94.1	103.8
Program $	$8,017,822	$8,464,411	$8,822,354	$10,256,242	$10,674,733
TRANSPORTATION					
FTE's	13.0	37.3	40.3	32.7	32.2
Program $	$3,46,767	$2,629,661	$3,557,763	$4,056,546	$3,491,805
PROGRAM TOTALS					
FTE's	755	865	844	723	718
PROGRAM $	$61,799,039	$64,076,715	$68,077,615	$70,779,043	$67,852,454

FTE = Full Time Equivalent Position

PROGRAM CATEGORIES

SIP DEVELOPMENT

PLANNING

Develop a regional Air Quality Management Plan (AQMP) to achieve federal and state ambient air quality standards and to meet all other requirements of the federal and California Clean Air Acts. Activities include analysis of air quality data, estimation of pollutant emissions by source category, development of pollutant control strategies, and projection of future air quality by computer models and statistical analysis of alternative control scenarios. Analyses are also prepared for issues pertaining to air toxics, acid deposition, and potential socioeconomic and environmental impacts of District plans and regulations. In addition, numerous outreach activities are conducted to solicit public input on proposed control measures.

SIP IMPLEMENTATION

RULE ENFORCEMENT

Enforce District rules for existing stationary sources of all pollutants.

(A) Conduct inspections of regulated facilities to determine compliance with District rules.

(B) Provide support to other agencies with respect to the handling and disposal of hazardous materials, as well as a wide range of air toxics issues.

(C) Issue Notices of Violation when violations are discovered and prepare enforcement cases for referral to the Chief Prosecutor.

(D) Provide training in rule compliance for regulated entities. This is accompanied by extensive outreach programs for many rules.

(E) Respond to and resolve citizen complaints concerning air pollution.

(F) Use injunctive remedy, abatement orders, and permit revocation remedies to seek compliance by chronic violators.

PERMITTING

Review and approve or deny applications for permits to construct and permits to operate equipment which may cause or mitigate the emission of criteria and toxic air contaminants. This includes engineering analysis to determine compliance with prohibitory rules, New Source Review, Toxics Health Risk Assessments, etc.

RULE DEVELOPMENT

Develop emission reduction regulations to implement the regional AQMP, Tanner Air Toxics Process (AB1807), National Emission Standards for Hazardous Air Pollutants (NESHAPS), and Prevention of Significant Deterioration (PSD) requirements. Activities include assessment of control technologies, evaluation of control cost, and solicitation of public input through meetings and workshops. In addition, a number of administrative rules are also prepared to ensure an effective permit program and increase rule effectiveness.

TECHNICAL SUPPORT

Provide technical support (including scientific studies) to facilitate overall air quality improvement programs.

(A) Provide ambient air quality data, source testing and laboratory services to facilitate District programs for all pollutants.

(B) Develop and utilize improved impact assessment techniques to evaluate the impact of proposed strategies and rules on the regional economy and regional environment.

TRANSPORTATION

Reduce emissions from mobile sources by implementing comprehensive transportation control programs.

Implement programs that will reduce daily commute trips, reduce fleet vehicle operations during air quality episodes, and increase the use of clean fuel vehicles by fleet operators.

Participate in programs that will reduce the impact of heavy duty vehicles on mobile source emissions by rescheduling shipping/receiving times.

Provide technical support to local governments developing congestion management programs.

Ensure compliance with the District's employee trip reduction program.

SIP ACTIVITIES FUNDED BY §105 GRANT

FEDERAL FY	OBJ/SUPP	DESCRIPTION	AWARD TOTAL	AWARD OBJ/SUP	DRAWDOWN	TOTAL FY SIP
1988–89	P.O. 1	SIP Management	$1,189,841	$71,866	$71,866	
	P.O. 3	Control Measures		$114,984	$110,308	
	P.O. 4	SIP Revision Documentation		$114,984	$114,984	
	P.O. 10	PM10 SIP		$114,984	$114,984	
	Carryover	87–88 NOx Control Planning	$50,000		$5,000	[redacted]
1989–90	P.O. 1	SIP Management	$1,414,849	$84,850	$84,850	
	P.O. 3	Control Measures		$116,730	$106,224	
	P.O. 4	SIP Revision Documentation		$116,730	$116,730	
	P.O. 10	PM10 SIP		$116,730	$116,730	
	Carryover	88–89 Control Measures	$4,599		$3,679	[redacted]
1990–91	P.O. 1	SIP Management	$2,577,510	$208,017	$208,017	
	P.O. 2	Transportation Ctrl Meas and Conformity		$208,016	$118,289	
	P.O. 3	Control Measures		$208,017	$150,177	
	P.O. 4	SIP Revision Documentation		$208,017	$208,017	
	P.O. 12	Clean Air Act Implementation				
		CAAA: Emissions Inventory		$89,339	$89,339	
		CAAA: Modeling		$89,339	$52,004	
		Coachella Valley PM10 Study		$20,000	$16,200	
		PM10 Implementation		$25,000	$19,500	
	Carryover	89–90 SIP Management	$2,335		$2,335	
		89–90 Control Measures	$10,506		$10,506	
		88–89 Control Measures	$920		$920	
		87–88 NOx Control Planning	$45,000		$4,500	[redacted]
1991–92	P.O. 1	SIP Management	$3,150,652	$97,004	$56,448	
		PM10 SIP		$136,153	$136,153	
		PM10 Antelope Valley		$20,000	$16,000	
		PM10 Coachella Valley		$93,076	$0	
		CO SIP		$373,268	$373,268	
		Ozone SIP		$892,967	$484,268	
	P.O. 3	Control Measures		$194,007	$181,127	
	P.O. 4	SIP Documentation		$194,006	$194,006	
	Carryover	90–91 Transportation Control Measures	$91,527		$43,764	
		90–91 Control Measures	$47,840		$47,840	
		90–91 PM10 Implementation	$5,500		$1,375	
		90–91 Coachella Valley PM10	$3,800		$950	
		90–91 CAAA Modeling	$17,336		$16,256	
		87–88 NOx Control Planning	$40,500		$4,050	[redacted]

SIP ACTIVITIES FUNDED BY §105 GRANT

FEDERAL FY	OBJ/SUPP	DESCRIPTION	AWARD TOTAL	AWARD OBJ/SUP	DRAWDOWN	TOTAL FY SIP
1992-93*	P.O. 1	SIP Planning	$3,482,946	$28,420	$14,210	
		CO SIP Requirements		$440,647	$264,388	
		Ozone SIP Requirements		$618,219	$309,110	
	P.O. 3	Control Measures		$198,937	$149,203	
	P.O. 4	SIP Documentation		$198,936	$198,936	
	Carryover	91-92 SIP Management	$25,226		$12,613	
		91-92 Antelope Valley PM10	$5,000		$2,500	
		91-92 Coachella Valley PM10	$93,076		$46,538	
		91-92 Ozone SIP	$228,677		$114,339	
		91-92 Control Measures	$12,677		$6,339	
	TOTAL SIP FUNDING FROM §105 GRANT					$4,356,298

*Projected

TABLE 1
SOCIO-ECONOMIC IMPACTS OF SCAQMD RULES, FISCAL YEAR 1990-1991

RULE NUMBER	RULE NAME	DATE ADOPTED	EMISSION REDUCTIONS (TONS/DAY)						COST EFFECTIVENESS ($/TON IN $1990)	ANNUAL CONTROL COST (IN $1990)	EMPLOYMENT IMPACT (JOBS/YEAR)
			NOX	VOC	CO	PM10	SOX	OTHER			
1102 AMEND	PETROLEUM SOLVENT DRY CLEANERS	6/90		.16					SAVINGS – 1,400	$10,000 PER YEAR FOR THE INDUSTRY; $625 PER PLANT	NOT CALCULATED(1)
1162 AMEND	POLYESTER RESIN OPERATIONS	6/90		N/A					N/A	SAVINGS FROM DELAYED COMPLIANCE	N/A
1110.2	EMISSIONS FROM GASEOUS- AND LIQUID-FUELED INTERNAL COMBUSTION ENGINES	9/90	39						2,000 – 33,400	$60 MILLION	-835
1146.1	EMISSIONS OF OXIDES OF NITROGEN FROM SMALL INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS, AND PROCESS HEATERS	10/90	6.79						6,161 – 16,135	$3.9 – $4.6 MILLION	-350 TO -423
1174	CONTROL OF VOLATILE ORGANIC COMPOUND EMISSIONS FROM THE IGNITION OF BARBEQUE CHARCOAL	10/90		2.5					NO INCREASE OR POTENTIAL SAVINGS	LOSS OF SALES TO MANUFACTURERS AND DISTRIBUTORS; SAVINGS TO CONSUMERS	NOT CALCULATED(1)
1107 AMEND	COATING OF METAL PARTS AND PRODUCTS	1/91		NONE					N/A(2)	NO INCREASE OR POTENTIAL SAVINGS	NO COST INCREASE OR POTENTIAL SAVINGS
1129	AEROSOL COATINGS	5/1/90		11.5					NO INCREASE OR POTENTIAL SAVINGS	REVENUE LOSSES UP TO $6.99 MILLION	-490
1135 AMEND	EMISSIONS OF OXIDES OF NITROGEN FROM ELECTRIC POWER GENERATING STEAM BOILERS	12/90	2.9						6,000	$12.8 MILLION	-492
1401 AMEND	NEW SOURCE REVIEW OF CARCINOGENIC AIR CONTAMINANTS	12/90						N/A	N/A(2)	NOT CALCULATED(1)	NOT CALCULATED(1)
1153	CONTROL OF VOLATILE ORGANIC COMPOUND EMISSIONS FROM COMMERCIAL BAKERY OVENS	1/91		8.4					1,700 – 2,200	$1.28 – $1.77 MILLION	NOT CALCULATED(1)
1405	CONTROL OF ETHYLENE OXIDE AND CHLOROFLUOROCARBON EMISSIONS FROM STERILIZATION OR FUMIGATION PROCESSES	1/91						N/A	N/A(2)(3)	AVERAGE OF $200 – $130,000 PER FACILITY; UP TO THREE TIMES THIS AMOUNT FOR A FEW LARGE FACILITIES	N/A(3)
1168 AMEND	CONTROL OF VOLATILE ORGANIC COMPOUND EMISSIONS FROM	3/91		2.3					(230) – 5,447	NOT CALCULATED(1)	NOT CALCULATED(1)

TABLE 1
SOCIO-ECONOMIC IMPACTS OF SCAQMD RULES, FISCAL YEAR 1990-1991

RULE NUMBER	RULE NAME	DATE ADOPTED	EMISSION REDUCTIONS (TONS/DAY)						COST EFFECTIVENESS ($/TON IN $1990)	ANNUAL CONTROL COST ($ IN $1000)	EMPLOYMENT IMPACT (JOBS/YEAR)
			NOX	VOC	CO	PM10	SOX	OTHER			
	ADHESIVE APPLICATION										
1164 AMEND	WOOD FLAT STOCK COATING OPERATIONS	3/91		MINOR					N/A(3)	NOT CALCULATED(1)	NOT CALCULATED(1)
1417	RECOVERY OR RECYCLING OF REFRIGERANTS FROM MOTOR VEHICLE AIR CONDITIONERS	5/91						2.4(5)	N/A(6)	35.8 MILLION COST; 59.9 MILLION NET SAVINGS FROM THE VALUE OF CFCS RECYCLED	+362

NOTES: ALL DOLLAR AMOUNTS ARE EXPRESSED IN 1990 DOLLARS.

N/A: NOT APPLICABLE

(1) INSUFFICIENT DATA RELATIVE TO COMPLIANCE ALTERNATIVES TO DETERMINE CONTROL COSTS/EMPLOYMENT IMPACTS
(2) NO EMISSION REDUCTION ASSOCIATED WITH RULE
(3) TOXIC AIR CONTAMINANT RULE--COST EFFECTIVENESS NOT APPLICABLE
(4) POTENTIAL EMPLOYMENT IMPACTS ARE NEGLIGIBLE--WITHIN THE BOUNDS OF UNCERTAINTY OF EMPLOYMENT VARIABILITY
(5) CHLOROFLUOROCARBONS (CFCS)
(6) GLOBAL WARMING GAS RULE--COST EFFECTIVENESS NOT APPLICABLE

K12:1564FNA

00012

TABLE 2

SOCIOECONOMIC IMPACTS OF SCAQMD RULES
JANUARY 1992 THROUGH DECEMBER 1992

Rule Number	Rule Title	Adopted Date	Emissions Reductions (tons/day) NOx	VOC	Other	Cost-Effectiveness (1990$/ton)	Annual Control Cost (1990 MM$)	Job Impact jobs/year
1145	Plastic, Rubber, and Glass Coatings	1/92		0.8		Savings	-1.6	39
1418	Halon from Fire Extinguishers	1/92			1.9(1)	N.A.(2)	-1.6	28
1128	Paper, Fabric, and Film Coatings	2/92		0.6		1700	0.3	-5
1106.1	Pleasure Craft Coating	5/92		0.22		4900	0.385	-29
1304	Exemptions (to Rule 1303)	6/92			N.A.(3)	N.A.(3)	-42.21	98
1420	Lead	9/92			11(4)	N.A.(5)	9.4	-26
403	Fugitive Dust	11/92			125(6)	94-199	4.3-9.14	-414

(1) Effective halon emission reductions weighted by ozone depletion potential.
(2) Cost-effectiveness not applicable to global warming gas.
(3) No overall emission impact on the Basin.
(4) Lead.
(5) Cost-effectiveness not applicable to toxic rules.
(6) PM10.

Table 6-3

Ranking of Control Measures

AQMP No.	Title	Dollars/Ton (1987 Dollars)	Ranking By Cost-Effectiveness	Ranking By Implementation
M-G-8	Aerodynamic Device for Trucks [ROG, NO_x, CO, PM10]	($5,800)	1	12
M-G-2	Low-Emission Retrofit of Transit Buses [NO_x, PM10, SO_x]	Savings	2	16
M-I-7	Eliminate Leaf Blowers [All Pollutants]	Savings	3	24
M-G-9	Eliminate Emissions from Advertising Vehicles [All Pollutants]	Savings	4	47
M-I-8	Emission Standards for Construction and Farm Equipment [ROG, NO_x, PM10]	$100	5	7
A-B-2	Control of Emissions from Gasoline Transfer, Phase-II [ROG]	$130	6	*
M-G-10	Eliminate CFC-Based Transport Refrigeration Systems [All Pollutants]	$200	7	8
P-A-4	Further Emission Reductions from Metal Cleaning and Degreasing [ROG]	$220	8	**
A-B-5	Further Control of Emissions from Gasoline Dispensing Facilities [ROG]	$220	9	15
A-A-2	Substitute Solvents Used for Clean-up of Surface Coating [ROG]	$300	10	*
A-E-3	Control of Dust Emissions from Agricultural Tilling [PM10]	$550	11	59
M-H-1	Environmental Review Program [ROG, NO_x, CO]	$640	12	*
A-F-5	Control of Dust Emissions from Wind Erosion [PM10]	$720	13	2
A-E-2	Control of Emissions from Livestock Waste [ROG, PM10, NH_3]	$950	14	5
M-G-12	Oxygenated Fuels Program [CO]	$1,000	15	1
A-B-6	Control of Emissions from Utility Engine Refueling Operations [ROG]	$1,100	16	9
A-B-3	Control of Emissions from Pleasure Boat Fueling Operations [ROG]	$1,200	17	44
M-H-2	Trip Reductions for Schools [ROG, NO_x, CO]	$1,250	18	*
P-C-6	Further Emission Reductions from Cement Kilns [NO_x]	$1,300	19	14
A-E-1	Control of Emissions from Pesticide Application [ROG]	$1,500	20	30
M-H-3	Supplemental Development Standards [ROG, NO_x, CO]	$1,700	21	18
P-B-7	Further Control of Emissions from Bulk Terminals [ROG]	$2,100	22	23
A-B-9	Control of Emissions from Active Draining [ROG]	$2,200	23	28
M-G-5	Motor Vehicle Buyback Program [ROG, NO_x, CO]	$3,500	24	36

* - Under current rule adoption schedule.

** - Has been adopted as a rule.

Table 6-3

Ranking of Control Measures
(Continued)

AQMP No.	Title	Dollars/Ton (1987 Dollars)	Ranking By Cost-Effectiveness	Ranking By Implementation
A-C-1	Control of Emissions from Large Commercial Bakeries [ROG]	$3,500	25	**
M-I-3	Control of Emissions from Marine Vessel Tanks [ROG]	$3,800	26	*
A-F-2	Control of Emissions from Construction, Demolition, and Onsite Vehicular Flow [PM10]	$4,650	27	3
A-C-2	Control of Emissions from Commercial Charbroiling [ROG, PM10]	$4,700	28	*
P-C-1	Further Emission Reductions from Rubber Products Manufacturing [ROG, PM10]	$4,800	29	*
P-A-3	Further Emission Reductions from Paper, Fabric, and Film Coating [ROG]	$5,000	30	*
M-I-5	Limit Sulfur Content of Marine Fuel Oils [SO_X]	$5,200	31	6
M-I-4	Control of Emissions from Marine Diesel Operations [NO_X]	$5,400	32	17
P-A-5	Further Emission Reductions from Perchloroethylene Dry Cleaning Operations [ROG]	$7,200	33	27
P-C-5	Control of Emissions from Metal Melting Furnaces [NO_X]	$7,500	34	48
P-B-5	Control of Emissions from OCS Exploration, Development, and Production [All Pollutants]	$8,200	35	11
P-C-6	Control of Emissions from Curing and Drying Ovens [NO_X]	$9,300	36	45
P-F-1	Phase-Out Stationary Sources Fuel Oil and Solid Fossil Fuel Use [ROG]	$11,300	37	*
P-C-3	Control of Emissions from Woodworking Operations [PM10]	$12,000	38	19
P-B-3	Control of Emissions from Gas Fired Petroleum Refinery Process Heaters [PM10]	$12,000	39	46
P-C-4	Control of Emissions from Small Boilers and Process Heaters [NO_X]	$12,900	40	*
P-C-7	Further Emission Reductions from Glass Melting Furnaces [NO_X]	$18,400	41	42
P-A-2	Further Emission Reductions from Automobile Assembly Coating [ROG]	$19,000	42	54
M-G-11	Inspection and Maintenance Program Enhancement [ROG, NO_X, CO]	$20,000	43	20
A-F-1	Installation of BARCT on Miscellaneous Sources [All Pollutants]	$23,000	44	13
M-I-1	Control of Emissions from Ship Berthing Facilities [NO_X]	$25,300	45	31
P-B-4	Improved Control of Emissions from Petroleum FCC Units [PM10]	$29,300	46	*
P-B-1	Control of Emissions from Petroleum FCC Units [SO_X]	$30,000	47	*
M-G-1	Zero-emission Urban Bus Implementation [ROG, NO_X, CO, PM10]	$30,000	48	34
P-C-2	Control of Emissions from Afterburners [NO_X]	$62,200	49	*

* - Under current rule adoption schedule.

** - Has been adopted as a rule.

TESTIMONY OF BEVERLY HARTSOCK, DEPUTY DIRECTOR, GOVERNMENT AND COMMUNITY AFFAIRS, TEXAS AIR CONTROL BOARD

Good morning. My name is Beverly Hartsock, and I am a member of the Texas Air Control Board staff. The Texas Air Control Board is pleased to have this opportunity to testify before this Subcommittee on the important topic of implementation of Title I of the Federal Clean Air Act. Programs needed to implement these new requirements for nonattainment areas have significant impacts for Texas and are of great importance to our agency.

The Texas Air Control Board is the air pollution regulatory agency for our state. As such, we are responsible for all permitting, investigation, enforcement, monitoring, inventory, planning, and regulation development for the state. We currently operate with a staff of approximately 700 located in a central and 12 regional offices throughout the state. We work directly with the U.S. Environmental Protection Agency (EPA) and with local and state officials to develop and implement all new control programs under the federal, as well as state, clean air acts.

In describing for you our experiences regarding implementation of the nonattainment area programs of Title I, it is important to provide you some background on the air quality problems that we currently face. As is true in most of the country, ozone is the most pervasive pollutant problem in Texas. We have four major urbanized areas that have been listed as nonattainment. These are the Dallas/Fort Worth area which is classified as a moderate ozone nonattainment area, the El Paso and Beaumont/Port Arthur areas which are listed as serious areas, and the Houston/Galveston metropolitan area which is a severe nonattainment area. Working to solve the nonattainment problems in these areas represents four very different and unique challenges. Not only are there varying degrees of severity of problem, but also divergent types of sources contributing to the problem. For example, Beaumont/Port Arthur is a highly industrialized area with relatively low population and vehicle emissions, whereas Dallas/Fort Worth is a large population center with a relatively low emissions contribution from major industrial sources.

Ozone is not the only pollutant for which we have experience in developing and implementing new control programs. El Paso, Texas is also a nonattainment area for carbon monoxide and particulate matter. Plans to address excess concentrations of these pollutants have been developed and new measures have been put into effect. Solution of air quality problems in the El Paso area continues, however, to be complicated by its situation as a community on the United States-Mexico border. We believe that long range solutions will ultimately hinge on an effective working partnership among all state, local, and federal authorities on both sides of the border.

Finally, we also have one area in Frisco, Texas designated as nonattainment for lead. A plan to ensure lowered emissions from the primary emissions source in this area has also been developed and implemented.

As you can see from the foregoing discussion, our experience in working with the provisions of Title I is extensive. I hope that through this testimony, the Subcommittee members will have an opportunity to gain insight from our experience.

Mr. Chairman, you asked that we specifically address five points. The first of these was how we have done in meeting the deadlines set out by the 1990 Amendments and the EPA rules and guidelines promulgated thereunder. I am pleased to report that, to date, Texas has met all of its deadlines. We are proud to note this accomplishment. We realize that many other states have not met all deadlines, and we understand their difficulties. The scope and timetable of actions set out by the statute for both EPA and the states have been extremely challenging. We have worked hard to achieve our accomplishments and perceive our counterparts in other states and at the federal level to be similarly occupied. However, design and establishment of this number of new programs involving this level change is of necessity a difficult, if not almost impossible, task.

With regard to the deadlines that we have faced so far, Texas has completed a carbon monoxide State Implementation Plan (SIP) for El Paso, a particulate matter SIP for El Paso, an oxygenated fuels program, a Stage II vapor recovery program, emissions inventories, nitrogen oxide reasonably available control technology (RACT) rules, volatile organic compound RACT rules, new source review rule enhancements, an employee trip reduction program, vehicle inspection and maintenance program design, new emission fees, and a small business assistance program. This list is not all inclusive, but I think it does serve to illustrate the significance of the progress we have made.

The second question you raised follows on from the first: how are we doing in meeting our deadlines and goals for this year? We believe that we are on target in

accomplishing the 1993 goals of Title I. We have developed emissions inventories for each of our ozone nonattainment areas, have adopted new control programs as previously outlined, and are in the process of analyzing and adopting additional controls for volatile organic compound and nitrogen oxide control measures impacting emissions from large and small businesses, motor vehicles, and citizen activities. In addition, we are proceeding with gathering extensive air quality data and conducting urban airshed modeling. We believe that we will be in a position to submit to EPA by November 15 a plan for each of our four ozone nonattainment areas that demonstrates significant emissions reductions that will occur by 1996 as a result of these new programs which the state is putting into place. Although formal rules governing all proposed new control measures may not be complete by the November 15 date, we will continue to work to complete all elements as soon as possible. This work on the 15% or "rate of progress" SIP also serves as the basis for our development of the attainment demonstration plans due for each of our nonattainment areas by November 15, 1994.

It may be of interest to note the results of the technical evaluations of our areas to assist the Subcommittee members in analyzing the kind of work that is part of these SIP efforts. Our areas have emissions inventories that vary in size from 75 tons per day in El Paso to 1,150 tons per day in the Houston/Galveston area. The sources of those emissions vary from area to area as well. Emissions from industrial sources contribute almost 75% in Beaumont/Port Arthur, but only 12% in Dallas/Fort Worth. On road vehicle emissions contribute from 6% in Beaumont/Port Arthur to 33% in El Paso and Dallas/Fort Worth. The projected growth in emissions for each of those areas also varies with Beaumont/Port Arthur being projected as our lowest growth area (2% emission growth) and Dallas/Fort Worth as our highest growth area (12.5% emissions growth). The types of controls to be implemented in each area are to a great extent similar, although the relative impact of each program varies depending on the significance of that type of emissions in the area's inventory. For example, Stage II vapor recovery will be implemented in each area. This new control will accomplish about 2.5% of the rate of progress SIP requirements in Beaumont/Port Arthur, 5% in Houston/Galveston, 8.5% in Dallas/Fort Worth, and 12% in El Paso. Some control measures will be adopted for only certain areas. Examples include an employee trip reduction program, which is only required in Houston/Galveston, and vessel cleaning controls which would have no effect if adopted for El Paso.

As I indicated, we are currently completing the SIP revisions due to be submitted in November. A series of public hearings will be held in each of our four nonattainment areas later this month. We expect to receive significant public testimony on these issues. The final plans adopted will be based on consideration of the technical data developed by our staff and the comments, support, and concerns expressed by the local communities and their representatives.

Although not a subject of today's discussions, I would like to note that, at this time, we are also finalizing our rules to implement the new Title V operating permit program. Considering the large number of industrial sites in Texas that will be affected by this new program, development of a program that can be effectively administered by the state and that will build on and augment current permitting programs, rather than conflicting with them, has been quite a challenge as well. We anticipate meeting the statutory deadline of November 15, 1993 for submittal of this program, and look forward to receiving delegation on schedule.

The third question you posed to us, Mr. Chairman, related to EPA's activities in implementing the 1990 Amendments. The point that EPA has not met all of its deadlines under the Act is not new information. Furthermore, there is no surprise associated with states' expressing concerns that lack of timely guidance from EPA often makes our jobs more difficult and, in some cases, impossible to do. It is also true that EPA has, in many ways, been of invaluable assistance to the states by providing needed guidance, developing rules for several new programs, and assisting states to interpret and develop program approaches to provide national consistency. One major difficulty we have experienced when EPA is late with guidance or rules that is not often highlighted occurs when states complete requirements prior to receiving final EPA guidance. Often the guidance will have changed during the finalization process, necessitating state rule changes for consistency or approvability. It is costly and time consuming to make these changes, and it adds an element of uncertainty to the process that is disruptive to cost-effective planning by the regulated community. We have no good solution for this problem, but have numerous examples of its presence throughout the implementation process. We believe the problem deserves more recognition as one of the primary problems we face in this state/federal implementation partnership.

Next, we were asked for suggestions as to the areas in which EPA assistance would be most useful to our state. In general, we believe that many times EPA focuses too much on detailed procedures, rather than the end result or air pollution goal to be accomplished. This serves to mire guidance development work in detail and impedes national decision-making by trying to cope with all manner of state and local differences. Delegation of more authority to EPA regional levels may also assist in improving the decision-making process. As previously indicated, timely guidance which remains constant is needed to allow states to move forward and adopt necessary new programs. Second guesses and moving targets will undermine effective state programs and waste the valuable resources of all parties in nonproductive efforts. EPA should also work to expedite national rulemaking on source categories with interstate markets and impacts, such as small engines, pleasure boats, construction equipment, aircraft, and airport operations. National attainment goals will not be met without these sectors of our economy shifting to more environmentally sound practices.

The last question we were requested to address related to our use of pollution prevention in implementing the 1990 Amendments. Pollution prevention is an integral part of many of the new programs being initiated under the Act. For example, reformulated gasoline prevents pollution by allowing a cleaner combustion process. In Texas, there are also aggressive programs to promote use of cleaner burning alternative fuels, such as natural gas. Dallas/Fort Worth and Houston/Galveston have also established new transportation control programs designed to reduce vehicle miles travelled, thus preventing some additional emissions from vehicles. An ozone alert program instituted this summer in the Dallas/Fort Worth area is aimed at minimizing emissions on days with meteorological conditions conducive to ozone formation, and thus preventing excess ozone concentrations. The Texas Legislature also established pollution prevention as a state environmental priority with passage of the Waste Reduction Policy Act of 1991 (SB 1099). This Act seeks to promote pollution prevention by requiring the development of source reduction and waste minimization plans for most industries in the state. Finally, Texas has initiated a program called Clean Texas 2000 to emphasize and publicize efforts being made by the public and private sector to voluntarily reduce all forms of pollution of our environment.

I hope that these comments will be useful to you in your review and oversight of state and federal efforts to implement the provisions of the Federal Clean Air Act. In 1990, you enacted far-reaching changes to the national air quality program and sent a strong message to the country that the goal of clean air for all of its citizens was not to be ignored or deferred. We will continue to try our best to live up to your high expectations and to honor our commitments in the stewardship of the environment.

Thank you again for this opportunity to testify.

STATEMENT OF DONALD F. THEILER, DIRECTOR, BUREAU OF AIR MANAGEMENT, DEPARTMENT OF NATURAL RESOURCES, STATE OF WISCONSIN

Wisconsin, as well as the other Lake Michigan States, has been diligently developing the necessary legislation, regulations and policies to meet the requirements of the 1990 Clean Air Act Amendments. In Wisconsin, significant effort has been expended to develop and begin implementation of the elements of our November 15, 1992 State Implementation Plan (SIP) submittal. These elements are vital building blocks in our effort to develop an ozone attainment strategy to eliminate the air quality problem in our state. We are on track to meet our November 15, 1993 SIP submittal requirements, which is the 15% volatile organic compound reduction effort.

To assist Wisconsin, we have established a Clean Air Act Task Force, comprised of interested citizens, and a Governor's Task Force, including the heads of state agencies and key legislators. A regional organization, the Lake Michigan Air Directors Consortium, including the states of Illinois, Indiana, Michigan and Wisconsin, is also in place and working closely with USEPA to develop a regional ozone attainment strategy.

While our states are moving ahead as best we can, lack of final federal guidance and regulations is still a significant obstacle as we begin to assemble our final ozone attainment plan and address the reasonable further progress requirements in the Clean Air Act.

As an example, USEPA is required to issue Control Techniques Guidance (CTGs) for 13 volatile organic compound (VOC) source categories by November 15, 1993, according to the 1990 Amendments. Two source categories are specified in the amendments and the remaining eleven are left to the discretion of USEPA. Shortly after enactment, USEPA developed a list and schedule for CTG development, including identification of eleven discretionary source categories. To date none of these CTGs has been finalized. Reductions from some of these required measures are critical elements of our 15% VOC reduction plans as well as to other states in the Lake Michigan Region.

These CTG documents were to include model regulations and implementation schedules. These documents are not only late, it appears that USEPA may not develop CTGs for many of the previously identified categories. This places an additional burden on the states who must now develop and implement regulations in a compressed period of time without the benefit of USEPA guidance. This could result in states promulgating inconsistent nationwide regulations for the same industry. It also increases the strain on state resources that are already being stretched to meet continuing obligations in 1992 SIP submittal, to prepare the 1993 15% reduction plan and to develop a creditable ozone ambient air quality attainment demonstration by the November 15, 1994 deadline.

We need USEPA to issue these CTGs to support state 15% plans, within the next six months. If USEPA cannot meet this time deadline, they should publicly declare their inability to provide the necessary guidance. They should state that each state which needs reductions from these categories will be expected to develop its own individual regulations without federal guidance. They should also make it clear that future USEPA guidance in these areas will be designed in such a way that it will not penalize states who have been forced to develop their own regulations.

It is important to understand that politically it is virtually impossible for an individual state to proceed to develop and promulgate regulations in an area where USEPA is working on guidance (CTGs). If the state does proceed and develops regulations which are not stringent enough, there is a possibility that the affected sources might install pollution control equipment which is rendered obsolete when USEPA disapproves the SIP revision because it does not measure up to the federal guidance. If, on the other hand, the state regulations are more stringent than the federal guidance, the state is accused of placing the sources at a competitive disadvantage with those states which follow the federal guidance. Both of these possibilities argue strongly for' the state to wait for federal guidance which, when delayed, causes the state to violate other deadlines in the law.

It is clear that the inability, of USEPA to develop and issue timely guidance threatens states' ability to plan and implement requirements at the state level and makes the states 'vulnerable to federal sanctions and lawsuits.

USEPA must similarly be held accountable. We support providing the agency with the staff and resources necessary to perform their responsibilities. USEPA must also work with the states and their regional offices to establish priorities that support state needs and timely state implementation of Clean Air Act requirements.

NOVEMBER 15, 1992 SIP SUBMITTAL STATUS

On November 15, 1992, Wisconsin submitted to USEPA a State Implementation Plan revision that included 13 elements required by the 1990 Clean Air Act Amendments. Of the 13 elements, 12 were formal submittals. The Employee Commute Options element was sent as an informational submittal and later supplemented by a formal submittal on January 8, 1993. To date, USEPA has made completeness determinations on 12 of the 13 submittals. Of these 12 submittals, nine have been determined to be complete.

USEPA has approved the Conformity and Planning Procedures elements. Approval of the Stage 2 Vapor Recovery element is imminent. The three elements found incomplete did not have final state regulations in place at the time of USEPA's completeness finding. Development of final rules for these elements, Employee Commute Options, VOC RACT Deficiencies and V0C Catch-up, is in the final stages. Submittal of these elements to USEPA is expected to occur shortly. We are awaiting USEPA action on the seven remaining elements.

In summary, Wisconsin expects to have all of the 1992 SIP submittal issues resolved within a few months. The possible exception is the problem of developing NO_x RACT for the ozone nonattainment areas. Until the photochemical reactive modeling is done for the area, it is not possible to determine whether NO_x controls should be pursued for the area.

The attached table summarizes the status of Wisconsin's 1992 SIP submittal (see Table 1).

PROGRESS TOWARD MEETING 15% VOC REDUCTION PLAN

Through our task force and work group structure, Wisconsin has been able to craft a 15% VOC reduction plan which relies on Clean Air Act mandated control measures for all but 2% of the required 1996 reductions. In order to fully implement these mandated measures, we are dependent on USEPA for guidance and regulations. Those federal measures include such things as the CTG's, as previously discussed, enhanced I/M and reformulated gasoline federal regulations (see Table 2).

The needed state authority has been developed or is under active development with the exception of measures which rely on federal guidance or regulation. We do not anticipate a problem obtaining state authority once federal guidance is available.

Final state rule promulgation on all the federally mandated measures and the needed optional measures will be impossible for the November 1993 submittal. This need not have been the case if federal action had been timely. Wisconsin requires at least a year for full regulation development as part of a SIP revision in order to provide for adequate public and legislative review and comment. The Department has developed a comprehensive schedule for 15% plan development, presentation, comment, hearing and finalization of plan components. Ultimate completeness will depend on the scope of outstanding federal, not state, actions.

USEPA appears to have some flexibility regarding the creditability of certain control measures for 15% plans. Where adequate state authority is demonstrated, credit should be allowed for measures that would have been fully creditable had USEPA followed the Title 1 schedule for needed federal actions.

TITLE I POLLUTION PREVENTION MEASURES

In general, Wisconsin sets performance standards for air pollution sources while encouraging and facilitating the use of pollution prevention measures in meeting these standards. In implementing Title I requirements, Wisconsin is relying on pollution prevention for several strategies. Pollution prevention strategies are inherent in the Employee Commute Options program, land use and urban design, enhancements to the current transit system in Milwaukee, and highway and traffic operations. In addition, Wisconsin is using the following pollution prevention strategies:

- Encourage the use of water-based coatings or inks, increased transfer efficiency high solids coatings and less-reactive solvents as viable compliance techniques.
- Support for the Great Printers Project, sponsored by the Environmental Defense Fund and the Council of Great Lakes Governors, which intends to evaluate pollution prevention strategies for the printing industry centered around the Great Lakes. This project has the potential to reduce VOC emissions in Wisconsin due to the significant number of printers in the state. The Wisconsin Department of Natural Resources is providing a large portion of the regulatory analysis for the project.
- Managing a USEPA Pollution Prevention Incentives to States grant which targets the Milwaukee ozone nonattainment area. One of the major goals of the project is to work with facilities which emit VOCs to identify pollution prevention opportunities in their daily operations.
- Evaluating the impact of industries switching from 1,1,1-Trichloroethane (TCA, a non-VOC solvent) to V0C solvent substitutes and investigating non-reactive alternatives to both TCA and higher VOC substitutes. The move away from TCA, which is non-photochemically reactive, to a more reactive VOC is due to the 1990 Clean Air Act Amendments which require labeling of products made with stratospheric ozone depleting compounds, such as TCA. Companies are concerned about the potential negative impact that the label may have on the sales of their product and are investigating a return to V0C solvents. The return to VOC solvents may impact our ability to achieve both the reasonable further progress requirements and attainment of the ozone standard.

USEPA's OBLIGATIONS

Significant delays in needed USEPA guidance, and in some cases, an outright vacuum in guidance can put Wisconsin at severe risk of not being able to meet the Clean Air Act's deadline for 15% plans. This absence of guidance has covered the gamut of Title 1 and 2 requirements ranging from conformity, reformulated fuels and inspection/maintenance program requirements to critical inventory and model-

ing guidance to an absence of planned-for stationary source regulations. As a result, states have been unable to meet many interim milestones necessary to achieve the early reductions. For states with biennial legislative and budget cycles, major uncertainty has surrounded the development of new types of authority needed to control air pollution sources. In some instances, Wisconsin made educated guesses concerning USEPA policy or sought very broad authority which would cover all contingencies.

Because expected Clean Air Act mandates will provide the bulk of most 15% plans for ozone, the major delays in federal regulations have been most problematic.

A prime example is the delayed enhanced I/M rule. Decisions regarding the final structure were delayed a full year in rulemaking. That caused states to delay their own efforts until greater certainty provided a basis for building political support for significant program revamping. The impact was a potential loss in reduction credits (for 1996) for a program that should meet 30–40% of the entire reductions within that plan.

On the stationary/area source side, the continuing delays in promulgation of promised CTGs and federal regulations for the largest remaining emissions categories (various unregulated coating activities, consumer/commercial product regulations, small engine regulations, etc.) leaves states without the capability to make up for shortfalls in expected mobile source controls.

On the inventory and modeling side, the ongoing uncertainties in critical area source emission factors combined with the continuing problems in USEPA's addressing of attainment modeling input and guidance needs have prevented states from being able to build viable control strategies on a timely basis.

Multiple CTG's were required under the Act by 1993. It is not clear how many are on a schedule to be useful for the 15% plans. The delayed CTG's and the delayed federal rules are causing about a quarter of the anticipated reduction credits for Wisconsin to be in jeopardy. For some other states, the "lost" benefit of these delays could be much larger—perhaps as high as 40% of the expected reductions.

Finally, ongoing delay in finalizing the reformulated gasoline rules raises the possibility that these regulations won't be fully effective by the 1996 ozone season. This could hamstring the states' capability to craft 15% plans, because of the critical importance of this mobile source measure.

Implementation of the most significant reduction measures have been delayed and compromised by federal, not state, inaction. Therefore states should be credited in their 15% plans for the promised federal measures where states can provide evidence of authority and the where-with-all to rapidly promulgate and enforce the control requirements once finalized at the federal level. Wisconsin is fully prepared to develop the necessary SIP revisions within 12 months of the federal guidance. Full program credit should be allowed in the 15% plans for authorized I/M enhancements, fuel regulations, and the various stationary and area source categories previously identified for federal action either by USEPA or within the Clean Air Act. The amount of allowed credit should be consistent across the regions and should be derived through discussions involving the states with USEPA headquarters.

It is an anomaly that the areas where we have little or nonfederal guidance are the areas in which we have been able to move in the most expeditious manner because we are not tied to waiting for federal action.

Examples of where the state has been able to proceed on its own are listed in Table 2.

RECOMENDATIONS

1) USEPA must set short-term priorities reflective of states' problems in meeting the hey components of the 1993 submittals. By ignoring these needs, USEPA will place most states at risk of not meeting the deadlines and may result in sanctions. In fact, without USEPA's commitment to meet rigid deadlines for all VOC-related CTGs and final regulations within the next 18 months, states could be trapped in mandated sanction situations without recourse. Those sanctions will be triggered by the absence of approvable SIPs for both 1993 and 1994.

2) USEPA should finalize guidance for the contingency plans which will come into effect if the state fails to achieve the 15% reductions.

3) USEPA must not allow dilution of the federally required control measures. Specifically, Stage 2 Vapor Recovery, fully-Enhanced I/M, fully-implemented federal CTG's and Reformulated Gasoline should not be diluted from the current anticipated levels of reduction. Without full implementation of these measures, few areas

will be able to show compliance with a 15% VOC reduction from adjusted 1990 baselines.

4) USEPA should be provided with the resources needed to meet its commitments. The USEPA has not been able to develop some of the required guidance due to budget reductions. This is a situation which can be reversed with adequate provision of resources.

5) If USEPA cannot develop CTGs for the 13 categories required by the Clean Air Act in a timely fashion, the agency should publicly cease work on the formal CTGs and provide whatever assistance available to the individual states which must develop regulation for these industrial categories. The fact that USEPA is working on the CTGs makes it virtually impossible for a state to unilaterally develop regulations for that industrial category until the CTG is published. Without the specter of a CTG, a state would be able to move ahead to develop regulations in a timely fashion. Wisconsin has been able to move forward to develop regulations when no federal guidance has been anticipated. This is not the optimum situation, but it is preferable to having sanctions imposed on the state.

In summary, Wisconsin is generally on course with the 1992 and 1993 SIP submittals. However, the lack of federal guidance and regulatory development is looming as a larger and larger problem. It is clear that the 15% reductions will not be achieved in 1996 without the needed federal actions. A solution satisfactory to all concerned should be pursued as expeditiously as possible. Wisconsin puts forward these recommendations in order to assist in this regard.

Thank you for the opportunity to present this to the Committee.

Table 1
State of Wisconsin
November 15, 1992
SIP Submittal Requirements

SIP Submittal Element	Date Submitted to USEPA-Region V	Date of USEPA Completeness Letter	USEPA Federal Register Final Rulemaking Date
Comprehensive 1990 emission inventory for Marginal and above ozone areas	November 15, 1992 January 15, 1993 - supplement July 16, 1993 - supplement	March 24, 1993	
Emission statement requirements	November 15, 1992 July 2, 1993 - supplement [a]	Letter pending from USEPA-Region V	
New source review rules pertaining to new offset requirements, lower applicability thresholds, new NSR provisions for NO_x in ozone nonattainment areas; new source review rules pertaining to other new sources	November 15, 1992 January 15, 1993 - supplement July 28, 1993 - supplement [a]	May 18, 1993 (USEPA did not send letter.)	
Conformity	November 15, 1992	January 26, 1993	June 24, 1993
Basic I/M program for counties that do not have I/M and where it must now be instituted and enhanced I/M program for serious and above ozone areas	November 15, 1992 January 15, 1993 - supplement [b]	January 26, 1993	
VOC RACT catch-up rules (non-CTG major sources)	November 15, 1992	Incomplete in January 15, 1993 USEPA letter	
Stage II vapor recovery	November 15, 1992 [a] March 29, 1993 - supplement	January 26, 1993	Soon to be published
VOC RACT deficiency and expansion	November 15, 1992	Incomplete in January 15, 1993 USEPA letter	
NO_x RACT	November 15, 1992 January 15, 1993 - supplement March 29, 1993 - supplement [c]	April 9, 1993	

Transportation control measures (TCM's) for reducing VMT	November 15, 1992 January 15, 1993 - supplement [d]	January 26, 1993	
Planning Procedures	November 15, 1992 January 15, 1993 - supplement	January 26, 1993	June 24, 1993
Small Business Assistance Program	November 15, 1992 January 14, 1993 - supplement	March 5, 1993	
Employee Commute Options	November 15, 1992 [c] January 8, 1993 [f]	Incomplete in January 15, 1993 USEPA letter	

[a] State regulation developed to address amended Clean Air Act was part of submittal.
[b] Wisconsin committed to program enhancements by November 15, 1993.
[c] Wisconsin committed to sending NO_x RACT rules to USEPA one year after receiving final federal approval of the revised November 15, 1992 SIP submittal.
[d] Wisconsin committed to send a complete SIP revision to USEPA by November 15, 1993 which identified a VMT offset plan.
[e] Wisconsin made information submittal.
[f] Wisconsin made formal state implementation plan submittal.

TABLE 2

Wisconsin 9 County Ozone Nonattainment Area(s)
Proposed Plan – 15% VOC Reduction for 1996

EXISTING FEDERAL or STATE MANDATES:	Status	Reductions: 1996 Tons	Reductions: Baseline %	Cummulative: Tons	Cummulative: %
MOBILE SOURCE CONTROLS					
1994–96 Tailpipe Standards	Federal Rule Adopted	1.0	0.3%		
Reformulated Gas – 6 Severe Counties	*Fed Rule Delayed*	14.9	4.4%		
Fully Enhanced I/M– 6 Severe Counties	*Federal Rule– Adopted Late*	18.7	5.5%		
I/M Expansion – Sheboygan County (MSA)	*Federal Rule– Adopted Late*	0.9	0.3%		
Employee Commute Options – 6 Counties	Federal Guidance Adopted	1.9	0.6%		
Travel Growth Impact (2%/Yr, 1990–1996)				−11.5	−3.4%
Fed and Mandates Subtotal (Net–of–Growth)				25.8	7.7%
INDUSTRIAL SOURCE CONTROLS					
Wood Furniture Coating	*Fed CTG Delayed*	1.7	0.5%		
State Haz Emissions Regulations (NR 445)	State Regulations Adopted *	1.2	0.3%		
5 of 13 Identified CTG Categories **	*Fed CTGs Delayed*	Evaluating			
Misc Wood Products Coating	*Fed CTG Delayed*	0.8	0.2%		
Yeast Manufacturing	Finalizing State Rule *	0.7	0.2%		
Screen Printing	Finalizing State Rule *	0.12	0.04%		
Foundries– Gray Iron and Steel	Finalizing State Rule *	0.06	0.02%		
Pop/Economic Growth (0.25%/Yr, 1990–1996)				−1.7	−0.5%
Fed and Mandated Subtotal (Net–of–Growth)				2.9	0.9%
AREA & OFF–ROAD SOURCE CONTROLS					
Architectural & Indus Maintenance Coatings	*Fed Rule Delayed*	4.2	1.2%		
Automobile Refinishing	*Fed CTG Delayed*	2.8	0.8%		
Reformulated Gas (Off–Road Engs. ~ 5%)	*Fed Rule Delayed*	2.2	0.6%		
Adhesives **	*Fed Rule Delayed*	Evaluating			
Stage 2 Vapor Recovery (w/Reform Gas)	Federal Rule Adopted	7.7	2.3%		
Pop/Economic Growth (0.25%/Yr, 1990–1996)				−2.1	−0.6%
Fed and Mandates Subtotal (Net–of–Growth)				14.7	4.4%
TOTAL FEDERAL & STATE MANDATES (Net)=				43.5	12.9%

OPTIONAL 1996 MEASURES: (State Discretion)

Reformulated Gasoline– 3 Moderate Counties	*Federal Rule Delayed*	1.8	0.5%	45.1	13.4%
Traffic Marking Regulations	Finalizing State Rule *	2.7	0.8%	47.8	14.2%
Gas Station Tank "Breathing" Controls	Finalizing State Rule *	1.0	0.3%	48.8	14.5%
Lower "Degreasing" applicability & limits	Finalizing State Rule *	2.0	0.6%	50.8	15.1%

* – *Not dependent on federal regulatory action.*

** – *Plastic Parts, Clean Up Solvents, Lithography, Wastewater, VOL Storage, Adhesives – ID'd in Plan or as Contingency*

STATEMENT BY JAMES H. WARE, DEAN OF ACADEMIC AFFAIRS, HARVARD SCHOOL OF PUBLIC HEALTH, HARVARD UNIVERSITY

Introduction

I appreciate the opportunity to appear today. Let me Begin by describing my professional background. I am the Frederick in Mosteller Professor of Biostatistics and the Dean for Academic Affairs at the Harvard School of Public Health. I received my Ph.D. from Stanford University, spent eight years at the National Heart, Lung, and Blood Institute, and have served on the Harvard faculty since 1979. My principal research interests are in environmental epidemiology, especially the health effects of air pollution, and in statistical methods for conducting environmental research. I am principal author or coauthor of several of the can epidemiologic studies cited by the Environmental Protection Agency in its Criteria Document for particulate air pollution. I served as a member of E.P.A.'s Clean Air Science Advisory Committee from 1984 to 1987, am a member of the Board of Scientific Counselors to the intramural research program of the National Institute of Environmental Health Sciences, and serve on the editorial staff of the New England Journal of Medicine as Statistical Consultant. I am a Fellow of the American Statistical Association and, in 1989, served as President of the Eastern North American Region of the International Biometric Society.

I am here today to summarize an important body of recent research on the health effects of particulate air pollution and its implications for risk assessment. Although I am solely responsible for my remarks, they draw heavily upon the research and writings of my Harvard colleague, Associate Professor Douglas Dockery, on the work of Professor Arden Pope who has been on sabbatical at Harvard for the past year, and on the work of Dr. Joel Schwartz of the Environmental Protection Agency. In particular, they draw upon a review of the relevant literature prepared by Professors Dockery and Pope for publication in the *Annual Review or Public Health (3).*

It has been known for many years that particulate air pollution produced by the burning of fossil fuels can increase respiratory mortality and morbidity rates. Dramatic evidence of these effects was provided by the notorious London and Donora fogs of the 1950's and early 1960's. For many years, however, it was believed that these effects were seen only at relatively high concentrations of particulate air pollution no longer experienced in the United States. During my term on the clean Air Science Advisory Committee, EPA revised the Criteria Document for particulate air pollution. During the preparation of the Criteria Document, Dr. Schwartz undertook a reanalysis or air pollution and mortality data in London from 1958 to 1972 (16). That analysis showed that the association between twenty-four hour average particulate air pollution concentration and daily mortality occurred over a wide range of concentrations, including concentrations routinely seen today in urban areas in the United States.

Those results stimulated numerous studies of particulate air pollution and daily mortality in urban areas in the United States. Most of these studies drew on methodology developed by Dr. Schwartz and, in many cases, Dr. Schwartz was a coauthor. Incidentally, this and other work has established Dr. Schwartz as one of the epidemiologists and he recently received the prestigious MacArthur fellowship.

These studies have provided consistent evidence that increases in particulate air pollution concentration are associated with increases in daily mortality rates. They show that mortality rates increase by about 1 percent per 10 microgram per cubic meter increase in the concentration of PM_{10}, the measure of particulate air pollution now used in the United States to regulate particulate air pollutants.

Over the last decade, a substantial number of epidemiologic investigations have also demonstrated that twenty-four-hour average particulate air pollution levels are associated with increased hospital admissions and emergency room visits, increased asthma attacks and bronchodilator usage among asthma patients, and reduced lung function and increased respiratory symptoms among children without preexisting conditions.

Taken as a whole, these studies provide coherent and consistent evidence showing that particulate air pollution affects respiratory health across a wide range of health endpoints, investigators, and study populations. I will first review this evidence in greater detail and then comment on its implications for environmental research and regulation.

Measurement of Particulate Air Pollution

Particulate air pollution is a general term used to describe air-suspended mixtures of particles that vary in size, composition, and origin. Particle size is expressed

in terms of aerodynamic diameter. The size distribution of particles in the atmosphere is bimodal. Large particles are 2.5 to 30 μm aerodynamic diameter and typically are basic in their pH. These large particles come from uncontrolled combustion and mechanical breakup of soil. Smaller particles are less than 2.5 μm in diameter and are often acidic. These particles include soot and acid condensates from vehicle emissions and other human activity.

In 1987, the EPA redefined the Ambient Air Quality Standard for particles, introducing PM_{10} the concentration or particles smaller than 10 μm, as the basis for regulation. This shift focused regulation on particles that could tend to be deposited in and damage the gas-exchanging portions of the lung. Older studies used a variety of measures of particulate air pollution, including total suspended particles (TSP), coefficient of haze (CoH), black smoke (BS), total sulfate (SO_4) and, more recently, $PM_{2.5}$ and PM_{15}. Methods described by Dockery and Pope (3) have been used to convert the results from these studies to measures of association with PM_{10} concentration.

Measures of Effect

For this summary, I have expressed the results from individual studies as the estimated change in the health measure resulting from a 10 $\mu g/m^3$ increase in daily mean PM_{20} concentration. Recent studies have used Poisson or logistic regression methods, which lead naturally to this measure of association. For older studies, the methods of Dockery and Pope (3) were used to convert results to this scale. Effect estimates on this scale are independent of the size or the population at risk, facilitating comparisons across communities of different sizes.

Mortality Studies

In the last few years, a series of studies have reported associations between particulate air pollution concentrations and daily mortality rates in communities across the United States (Table 1). These studies provide strikingly consistent estimates of the effect of particulate air pollution levels on daily mortality. The effect estimates range between a 0.6% and a 1.6% increase in daily mortality for each 10 $\mu g/m^3$ increase in PM_{10} concentration.

Four of the studies also provided a breakdown of mortality by cause of death (Table 2). Respiratory deaths, representing 2% to 8% of total mortality, had effect estimates between 1.5% and 3.7% increase per 10 $\mu g/m^3$ increase in PM_{10} in these studies. No associations with cancer mortality were found.

Several concerns have been raised about these studies. First, are the associations actually attributable to other pollutants, for example, sulfur dioxide or ozone? Statistical analysis and consistency of results across a range of communities shows that they are not. Several studies evaluated sulfur dioxide as a risk factor for daily mortality. These studies consistently found that associations between daily mortality and sulfur dioxide were weaker than those with particulates, and that the associations with particulate concentrations remained after adjustment for sulfur dioxide concentration. Similarly, these associations have been found in communities with high and low levels of ozone pollution, and adjustment for ozone concentration has not affected the association between particulate concentration and daily mortality.

A second concern is these associations are actually due to the association of a third factor or factors with both particulate concentrations and daily mortality rates, a phenomenon called confounding by epidemiologists. For a factor to confound the relationship between pollution and daily mortality, it must vary over time. Hence, personal factors such as diet, smoking, and genetic predisposition cannot induce a relationship between pollution level and daily mortality rate. More plausible candidates include seasonal variation in mortality rates, weather, and infectious disease epidemics. Several authors have explored these issues in detail, and they do not offer a plausible explanation for the observed associations.

Infectious disease epidemics and season

Many of the studies have found associations between air pollution levels and mortality rates during the summer months. Unpublished work by Dr. Schwartz has shown that the associations during the summer months are comparable in magnitude to those seen during the winter months. Moreover, the magnitude of the observed association is consistent across time and between communities, while the strength of the correlation between infectious disease rates and particulate air pollution correlations would be likely to vary geographically and temporally.

Weather

Weather patterns differ and their covariation with air pollution concentrations also varies substantially across the communities in which the association has been

demonstrated. The associations have been seen in both warm and cold climates and are independent of humidity. A variety of statistical methods have been used to control for time of year, temperature, and humidity, with negligible effects on the associations.

Hospital Admissions and Emergency Room Visits

If the associations between particulate air pollution concentration and mortality reflect a causal relationship, one would expect to see associations between particulate concentrations and other measures of respiratory health. A growing body or studies reports such associations across a wide range of respiratory endpoints. Studies showing an association with hospital admissions (2, 25, 26) and emergency room visits (15, 23, 24) are of particular interest. The effects seen in these studies are similar in magnitude to the associations found with mortality, as would be expected if exposure to particulate air pollution caused an increase in severity of respiratory disease among a vulnerable subgroup of the population (Tale 2).

These results are supported by a relatively new and rapidly growing body of epidemiologic work showing associations between particulate air pollution concentration and exacerbation of asthma, decline in pulmonary function level, and increased rates of respiratory symptoms (3). One serendipitous study was performed in Utah County, Utah, the site of a large integrated steel mill whose emissions were contained by frequent inversions in the valley (10;11). Dr. Pope examined hospitalization rates for children in Utah County and in too adjacent counties, Cache and Salt Lake County, during the mid 1980's. Although the three counties had similar demographic and housing characteristics, the rate of hospitalizations of children for respiratory illness in Utah County was about twice that in the neighboring counties. In August, 1986, the steel mill was closed by a strike and remained close for 13 months. During that period, the rate of hospitalizations for respiratory illness fell rapidly and ultimately became indistinguishable from that in the neighboring counties. When the steel mill was reopened, the rate rebounded and soon returned to its level before the closing.

This group of studies, most of which have been published since 1990, points to adverse effects of exposure to particulate air pollution on a spectrum of health endpoints, including pulmonary function, respiratory morbidity, hospital visits and admissions, and mortality. Moreover, these associations are seen over the range of air pollution levels typical of American urban areas.

Some pulmonary physicians express caution about these epidemiologic findings because they have not been supported by toxicologic studies. Studies of animals and of volunteers exercising in environments with high levels of acidic aerosols, for example, do not show inflammatory responses at concentrations substantially above outdoor concentrations. Our confidence in the causal explanation for these findings will be strengthened by additional work investigating the mechanism by which these effects occur. Nevertheless, a recent editorial by Professors John Samet and Mark Utell, two distinguished air pollution epidemiologists, acknowledges that, while they are not yet prepared to support the observed relationships as causal, "they cannot strongly support specific alternative explanations".

Thus, the Environmental Protection Agency will soon be faced with the challenge of reevaluating the evidence regarding the adverse health effects of particulate air pollution. Indeed, work on a revised Criteria Document for PM_{10} is scheduled to begin next year. The new research provides little or no evidence for the existence of a threshold for the observed associations. This will make it difficult if not impossible to establish a standard for protection of human health that is supported scientifically. Given the unequivocal nature of the epidemiologic evidence, the best hope for clarifying the scientific information lien in additional human and animal studies designed to improve understanding of the deposition and clearance of particles, the cellular and molecular effects of particles on the lung, and continued work on the chemical and physical composition of particulate air pollution. This work can best be conducted through sponsorship from the National Institute of Environmental Health Sciences, the Health Effects Institute, or the Environmental Protection Agency.

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Table 1

Studies of Particulate Concentrations and Daily Mortality

LOCATION (REF) AND PERIOD	PARTICULATE MEASURE	MEAN PM_{10} ($\mu g/m^3$)	PERCENT CHANGE IN DAILY MORTALITY PER 10 $\mu g/m^3$ INCREASE IN PM_{10} (95% CI)
TOTAL MORTALITY			
St. Louis, MO (5) 1985-86	PM_{10}	28	1.5% (0.1%, 2.9%)
Kingston, TN (5) 1985-86	PM_{10}	30	1.5% (-1.3%,4.6%)
Santa Clara, CA (6) 1980-82, 84-86	CoH	35	0.8% (0.2%,1.5%)
Philadelphia, PA (19) 1973-80	TSP	40	1.2% (0.7%, 1.7%)
Birmingham, AL (22) 1985-88	PM_{10}	48	1.0% (0.2%,1.9%)
Utah Valley, UT (14) 1985-89	PM_{10}	47	1.5% (0.9%,2.1%)
Detroit, MI (18) 1973-82	TSP	48	1.0% (0.5%,1.6%)
Steubenville, OH (20) 1974-84	TSP	61	0.7% (0.4%,1.0%)
RESPIRATORY MORTALITY			
Santa Clara, CA (6) 1980-82, 84-86	CoH	35	3.5% (1.5%,5.6%)
Philadelphia, PA (19) 1973-80	TSP	40	3.3% (0.1%,6.6%)
Utah Valley, UT (14) 1985-89	PM_{10}	47	3.7% (0.7%,6.7%)
Birmingham, AL (22) 1985-88	PM_{10}	48	1.5% (-5.8%,9.4%)

Table 2

Studies of Particulate Concentrations and Hospital Usage

LOCATION (REF) AND PERIOD	PARTICULATE MEASURE	MEASURE OF HOSPITAL USAGE	% CHANGE IN USAGE PER 10 $\mu g/m^3$ INCREASE IN PM_{10} (95% CI)
HOSPITAL ADMISSIONS			
New York City (26)	SO_4	Asthma	1.9% (0.4%,3.4%)
Buffalo, NY			2.1% (-0.6%,5.0%)
Toronto, ONT (25) Summer 86-88	$PM_{2.5}$	Asthma	2.1% (-0.8%,5.1%)
New York City (26)	SO_4	All Respiratory	1.0% (0.2%,1.8%)
Buffalo, NY			2.2% (0.6%,3.8%)
Toronto, ONT (25) Summer 86-88	$PM_{2.5}$	All Respiratory	3.4% (0.4%,6.4%)
Southern Ontario (2) Summer 83-88	SO_4	All Respiratory	0.8% (0.4%,1.1%)
EMERGENCY ROOM VISITS			
Seattle, WA (23) 1989-90	PM_{10}	Asthma	3.4% (0.9%,6.0%)
Steubenville, OH (15)	TSP	All Respiratory	0.5% (0.0%,1.0%)
Barcelona, SP (24) Winter 85-89	BS	COPD	2.3% (1.4%,3.2%)

STATEMENT OF REBECCA BASCOM, M.D., ON BEHALF OF THE AMERICAN LUNG ASSOCIATION

Mr. Chairman, members of the Subcommittee, I am Dr. Rebecca Bascom, Associate Professor of Medicine at the University of Maryland School of Medicine and Director of its Environmental Research Facility. Today I am presenting comments on behalf of the American Lung Association.

Based on our knowledge of the adverse health effects of air pollution, the American Lung Association places a very high priority on preserving and strengthening the federal government's air pollution control program. I am pleased to appear before the Subcommittee and to discuss the health effects of ozone air pollution.

Next year the American Lung Association will celebrate the 45th annual Clean Air Week. This week was established to commemorate the 1948 air pollution disaster in Donora, Pennsylvania and recognize that a partnership between citizens, government and industry is necessary to achieve clean, healthful air. After 45 years, it is clear that we still have not achieved our goal of clean air. Rather, we have seen the clean air progress of the 1970s give way to stagnation in the 1980s and confusion in the early 1990s.

Ozone smog is a problem in large portions of this country, not just in urban areas. While each area contributes to its own smog problem, it also may compound the problems of its downwind neighbors. The air entering many states today is already heavily polluted. A report from the Office of Technology Assessment suggests that ozone levels in the air mass entering nonattainment areas in the urban northeast can be 0.07 parts per million, nearly 60 percent of the current health-based standard.

We are currently at the height of the ozone smog season—May to September. In light of the U.S. Environmental Protection Agency's decision not to revise and strengthen the National Ambient Air Quality Standard for Ozone, the American Lung Association believes that—now more than ever—it has the responsibility to draw public attention to the problems of air pollution and the risk of lung disease from ozone exposure by vigorously issuing ozone smog watches.

An "ozone smog watch" is issued by local Lung Associations based on the next day's predicted weather. It is intended to inform the public of the increased risk of unhealthful smog levels and remind individuals to avoid outdoor exercise and other activities that may increase ozone exposure and cause adverse health effects. A "watch" is issued whenever: 1) the ozone Air Quality Index reading for the previous day was 70 or higher on the Pollution Standards Index (PSI) scale, and 2) the weather for the coming day is expected to be hot and sunny, with stagnant wind and no rain. A reading of 70 on the PSI correlates to an ozone concentration of 0.084 parts per million. The American Lung Association justifies cautioning the public at ozone levels below the current federal standard because a growing body of research strongly suggests that adverse respiratory effects occur at ozone levels well below the current standard of 0.12 parts per million averaged over one hour.

When the American Lung Association first appeared before the Senate Committee on Environment and Public Works in 1981, we appended our comments with a "state of the art" review entitled, *Health Effects of Air Pollution*, published by the American Thoracic Society, our medical section. An updated volume of that report will be published soon and will be made available to this subcommittee. My comments on the health effects of ozone are drawn from the many excellent scientific studies our committee reviewed during the preparation of this latest volume.

In general, the health effects of air pollution, ozone as well as other pollutants, are currently evaluated on the basis of three types of evidence:

- *Epidemioloaical field studies:* These studies are performed during real-life exposures to naturally occurring ambient air pollution. Individual exposures are usually estimated from data provided from air monitoring stations. Entire populations in a region can be studied over years, for example, by correlating air quality measurements with hospital visits or admissions for respiratory complaints such as asthma—morbidity, and with deaths—mortality:
- *Controlled exposures:* In these studies a specifically polluted atmosphere is created and controlled in an environmental chamber, such as the one at my university, the University of Maryland at Baltimore. Carefully selected volunteers are exposed in a precisely quantifiable manner and the effects are assessed. Chronic irreversible effects, such as cancer or chronic obstructive lung disease, cannot be investigated in this manner. We can however begin to understand the

problem of susceptibility to pollutants and to demonstrate the length between a specific pollutant and a specific effect.

- *Animal toxicology:* This form of study is particularly useful for the investigation of irreversible changes and for studies of toxicologic mechanisms. Animal studies are used when working with human subjects is not appropriate or feasible.

While stationary source pollution was responsible for the more notorious air pollution disasters such as the Meuse Valley, Belgium (1930), London (1952) and Donora, Pennsylvania (1948) incidents, mobile source pollution was first recognized as a phenomenon of the Los Angeles basin, called photochemical smog. Smog, a layer of "haze", is irritating to the eyes, nose, and respiratory system. The nasal and respiratory irritant is ozone, which is often classified as an "oxidant". The ozone in smog is generated photochemically from hydrocarbons and nitrogen oxides present in automotive emissions and refueling procedures, among other sources.

Ozone pollution can travel long distances and that large downwind, suburban or even rural areas can be affected by ozone-containing air generated from urban pollutant emissions. It is also clear that prolonged elevations ozone for many hours of duration frequently occur in addition to the short-term morning and evening peaks associated with rush-hour traffic.

The current National Ambient Air Quality Standard for ozone of 0.12 parts per million was established in 1979, a reversal from the previous standard for photochemical oxidants of 0.08 parts per million. The primary scientific basis for this change included clinical and epidemiological studies published in the 1970s of children and asthmatics exposed to ozone levels of between 0.15 and 0.25 parts per million. These studies found increased cough, wheezing and shortness of breath as well as small loss of lung function in the test subjects. However, as early as 1975, studies of the effect of photochemical smog on school children in Japan found lung function reductions at oxidant levels as low as 0.10 parts per million. Animal studies found increased susceptibility to respiratory infection at ozone levels as low as 0.10 parts per million.

Beginning in the early 1980s, studies published on the acute respiratory effects of ozone on healthy exercising children and adults at or just above the 0.12 part per million level found increases in acute respiratory symptoms such as those described above and decrements in lung function. Such acute respiratory symptoms and decrements in lung function can be seen in the 5–20 percent of the general population that is considered to be particularly sensitive to ozone. Toward the end of the decade, a number of clinical studies demonstrated increases in respiratory symptoms, decrements in lung function, heightened sensitivity to bronchoconstricting agents, and cellular and biochemical evidence of lung inflammation in healthy, exercising subjects at ozone levels as low as 0.08 parts per million when the exposure duration was increased to approximately seven hours. Several of these studies were designed with moderate exercise levels that mimic the activity level of an outdoor construction worker. This cumulative effect of ozone is of particular concern because the heavily populated areas of the eastern United States frequently experience ozone peaks between 0.08 and 0.12 parts per million for six to eight hours at a time.

Epidemiological data linking ozone air pollution to increased hospitalization and hospital visits for respiratory disease, especially asthma, have emerged as another important public health concern. These studies link increased hospitalization rates with 1 hour average levels of ozone below the current standard. The acute respiratory symptoms decreased function and inflammation that accompany ozone exposure, while unpleasant for the general, healthy population, can be particularly devastating to the person with asthma or chronic obstructive lung disease. A 1991 clinical study of people with atopic asthma found increased responsiveness to common allergens with a 1-hour exposure to 0.12 parts per million of ozone while at rest. These allergens often serve as the "trigger" for asthma attacks, and this finding might help to explain the increase in hospital visits and admissions for asthma-related problems during the higher ozone summer months.

Perhaps the most important public health issue related to exposure to ozone air pollution is concern about chronic effects from long-term exposure. The health effects that provided the basis for the National Ambient Air Quality Standard for Ozone in 1971 and for the 1979 revision of that standard were primarily acute effects such as respiratory symptoms and reduced lung function. However, a number of animal toxicology studies have been published since the mid-1980s that chronic exposure to ozone levels that typically occur in the ambient air result in local changes in upper respiratory cells and cells at the junction of the airway and alveoli. Coincident with these findings was the publication of a number of studies that allow for increased confidence in extrapolating the animal studies to human populations.

Epidemiological studies of residents of high ozone areas in Southern California found that they have an accelerated loss of lung function in comparison to residents of areas with lower ozone levels in Southern California and Michigan. This information adds to the mounting evidence of important adverse health effects occurring from long-term exposure to ozone. A 1991 study of children in Austria found that long-term exposure to high ozone levels may lead to persistent bronchial hyperresponsiveness. These studies strongly suggest that chronic exposure to high ozone levels may be associated with a premature aging of the lungs and development of chronic lung disease.

An additional source of concern regarding the chronic effects of ozone are findings that high levels of this pollutant enhance the formation of tumors in mice and enhance the ability of normal cell transformation to cancerous cells both along and concurrent with exposure to a carcinogen *in vitro*. It is, however, premature to draw conclusions about ozone and cancer in humans.

National Ambient Air Quality Standards are to be established with a particular concern for populations at risk, those population subgroups that are potentially at higher risk from exposure to the criteria pollutants. The definition of sensitive populations ;has been broadened over the year by the Environmental Protection Agency to also include people who demonstrate a greater than average response to an air pollutant or who have an inherent predisposition to such a response. EPA has identified the following subgroups within the population in their definition of sensitive populations for ozone: otherwise healthy people who exercise outdoors, especially those people who respond with particular intensity to even relatively low ozone levels; and people with preexisting respiratory disease, including asthma, allergy, and chronic obstructive pulmonary disease such as chronic bronchitis and emphysema.

In addition to the at-risk populations identified by the Environmental Protection Agency, the American Lung Association believes that children and the elderly should be considered as an at risk population for ozone. Children should be considered a sensitive population due to the fact that their exposure to ambient ozone is significantly higher than the general population.

Children frequently spend a considerable amount of time outdoors during the time of year when ozone levels are the highest (May-September) while engaged in vigorous exercise. Also, children's lung defenses have not fully matured. The magnitude of damage to lung tissue may be greater in children for an equivalent level of ozone due to less fully developed defense mechanisms. In children the dose to target tissue may be greater since children's ventilation per unit of body weight is higher than adults.

Finally, children appear to be less likely to exhibit acute symptoms such as wheezing or shortness of breath than adults for an equivalent level of ozone. Therefore, children may be more inclined than adults to continue to expose themselves to potentially damaging ozone levels.

The elderly should also be considered an at-risk population since they already suffer a decline in lung function as part of the natural aging process and may therefore be less able to tolerate a further decline in lung function due to ozone exposure. The elderly also suffer higher rates of chronic lung and heart disease and therefore may be at greater risk of having their condition exacerbated by exposure to ozone.

A recent report by the American Lung Association, *Breath in Danger II*, estimates that for than 31 million children and over 18 million elderly people in the United States could risk lung disease or respiratory irritation because of their exposure to unhealthful levels of air pollution. The report estimates that 66 percent of Americans live in areas that fail to meet one or more of the current National Ambient Air Quality Standards. In 1989, the estimate was 60.5 percent of Americans lived in nonattainment areas. The report is an analysis of pollution classification data provided by the Environmental Protection Agency, population statistics from the U.S. Census Bureau and prevalence rates for certain medical conditions from national health surveys. For ozone, 434 counties and cities fail to meet the National Ambient Air Quality Standard. The estimated total population exposed to unhealthful levels of ozone is 150,177,754. This includes 29,906,621 pre-adolescent children, and 17,929,500 Americans over the age of 65 years. The complete report is attached to my comments.

There has been considerable debate in the scientific and medical community regarding the significance for public health of relatively small transient, reversible reductions in lung function, mild levels of unpleasant but not incapacitating symptoms such as coughing, wheezing, and shortness of breath, and biochemical evidence of

lung tissue inflammation. The American Thoracic Society and the Environmental Protection Agency itself have attempted to put this issue in a structured context. Given the current state-of-the-science regarding the relationship between reversible, transient health effects to the development of more severe, non-reversible chronic effects, it is not possible at this time to fully understand the significance of this relationship. However, the American Lung Association believes that the findings of biochemical evidence of lung tissue inflammation at levels of ozone well below the current National Ambient Air Quality Standard as well as evidence of increased need of medications and increased hospitalization rate for people with asthma and preliminary evidence of premature loss of lung function, morphological changes to lung structure and possible carcinogenicity, support the need for a prudent public health policy that provides protection against repeated insult and injury to delicate lung membranes.

In the opinion of the American Lung Association, the current National Ambient Air Quality Standard for Ozone does not represent prudent public health policy. The ALA has petitioned the United States Court of Appeals for the District of Columbia Circuit to review the final action of the Administrator of the Environmental Protection Agency regarding its March 1993 decision not to revise the National Ambient Air Quality Standard for ozone. This decision was made after a 1991 lawsuit filed by the ALA succeeded in forcing the Agency to review the NAAQS for ozone by March 1, 1993. The American Lung Association is particularly concerned that recently EPA staff have suggested the schedule for completion of the current review process for the ozone NAAQS will extend well into 1997.

The 1970 Amendments to the Clean Air Act contain the basis of the public health provisions of the nation's effort to control air pollution emissions. Section 108 of the Act requires the Environmental Protection Agency to identify all air pollutants that, in the judgment of the Administrator, cause or contribute to air pollution that ". . . may reasonable be anticipated to endanger public health", and to issue air quality criteria for such pollutants that reflect ". . . the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health and welfare which may be expected from the presence of such pollutants in the ambient air. "Based on information generated under Section 108, Section 109 requires the Administrator to promulgate National Ambient Air Quality Standards . . . " which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health." Conspicuous by its absence is the lack of any reference in this section of the Clean Air Act allowing for consideration of economic cost or technological feasibility in setting these standards. In fact, the legislative history of the Clean Air Act indicates that a deliberate decision was made that protection of public health and welfare was to be the sole determinant in deciding on an acceptable level of air pollution. Political, economic, and technological factors were then to be integrated into the process of selecting and implementing pollution control strategies for attaining these standards. The legislative history for Section 109 describes in further detail the concept of setting a National Ambient Air Quality Standard at a level that is low enough to protect the health not only of the general healthy population but also people who are particularly sensitive to air pollution such as those people with asthma and emphysema.

To ensure that a National Ambient Air Quality Standard reflected the most up-to-date scientific information, Section 109 of the Clean Air Act was amended in 1977 to require that the air quality criteria used by the Environmental Protection Agency to set the NAAQS and the NAAQS themselves be reviewed and, if necessary, revised at no more than five year intervals beginning in 1980.

The preponderance of clinical, epidemiological and field study data is sufficient to refute the adequacy of the National Ambient Air Quality Standard for ozone of 0.12 parts per million for one-hour in protecting public health from the acute effects of ozone. In late 1988, approximately one-half of the members of the Ozone Review Committee of Environmental Protection Agency's Clean Air Scientific Advisory Committee recommended to the Administrator that the primary one-hour ozone NAAQS be revised to a level below 0.12 parts per million. In addition, a majority of the Ozone Review Committee, including several experts who had not recommended tightening the primary standard, noted that ". . . at 0.12 parts per million there was little or no margin of safety".

The American Lung Association believes that data from a variety of scientific disciplines regarding the acute and chronic effects of ozone at levels well below the existing health standard overwhelmingly support a revision of the primary ozone standard to a level well below the current National Ambient Air Quality Standard. This

accumulation of data was ignored by the Environmental Protection Agency, which twice missed Clean Air Act-mandated deadlines to review and, if necessary, revise the ozone standard in 1985 and 1990.

A 1991 American Lung Association analysis of an alternative National Ambient Air Quality Standard for ozone of 0.08 parts per million averaged over eight hours, based on actual monitoring data, found that almost 32 million people live in 68 areas in the United States that would be classified as unhealthy under this scenario although these areas are in attainment for the current standard. Ozone pollution control programs will not be developed for these areas and people living in these areas will falsely believe that they enjoy healthful air quality.

Another significant finding of the 1991 ALA study was that the number of ozone exceedance increased dramatically, often by a factor of ten or more, when comparing the number of violations of the 0.12 parts per million one-hour ozone standard with the number of exceedances of a 0.08 parts per million level averaged over eight hours. These large exceedance ratios were particularly prevalent for medium-sized metropolitan areas of the Southeast United States, which frequently experience ozone levels between 0.08 and 0.12 parts per million for extended periods of time.

The public health implications of the growing body of scientific evidence are immense. Lung disease, including lung cancer, is the third leading cause of death in the United States and is fastest growing cause of death among the top 10 causes of death. The cost to society in terms of direct expenditures for health care, lost productivity, restriction of daily activity and reduced quality of life, and suffering of acute symptoms and premature death is likely in the billions of dollars each year for ozone alone.

Congress should insist on enforcement of the provisions of the 1990 Clean Air Act Amendments in order to solve the widespread problem of violations of the current ozone standards. Based on the scientific information I reviewed earlier, the American Lung Association recommends that:

- The current National Ambient Air Quality Standard for ozone of 0.12 parts per million for one hour should be either strengthened or augmented with a new six-or-more-hour short-term standard to protect public health from the acute adverse effects demonstrated with multi-hour exposures to ozone levels as low as 0.08 parts per million. The current National Ambient Air Quality Standard for ozone does not protect public health with an adequate margin of safety as required by the Clean Air Act.
- An expanded 3-pronged research program on the health effects of long-term exposure to ozone should be funded and implemented on an accelerated schedule.

1. The effect of ozone on asthmatics with respect to disease severity, medication use, hospitalization rates and allergic sensitivity must be better understood. There should be an estimate of the public health impact of these findings.
2. The susceptibility to ozone among normal healthy people require further understanding, particularly with respect to the issue of inherited sensitivity to ozone.
3. It is imperative that the preliminary findings of potentially serious health effects from long-term exposure to ozone be rapidly replicated and expanded so that a sufficiently robust scientific data base from credible studies is available as soon as possible to determine the need for a seasonal or annual ozone standard. The emerging scientific information on chronic effects of ozone should be given significant weight in the Environmental Protection Agency's regulatory decision regarding an adequate margin of safety for a new or revised short-term ozone standard.

Thank you.

TESTIMONY OF ROBERT D. BRENNER, ACTING DEPUTY ASSISTANT ADMINISTRATOR, OFFICE OF AIR AND RADIATION, ENVIRONMENTAL PROTECTION AGENCY

Mr. Chairman and Members of the Subcommittee, I am pleased to have this opportunity to discuss with you the Environmental Protection Agency's (EPA's) activities to fulfill the requirements of section 185B of the Clean Air Act, as well as other issues related to Agency programs to address risks associated with ground level ozone. As you know, in section 185B of the Act as amended in 1990, Congress required EPA, in conjunction with the National Academy of Sciences, to conduct a study of the role of ozone precursors in the formation and control of ground-level ozone, in particular the role of nitrogen oxides (NO_x) and volatile organic compounds (VOCs).

Among other things, section 185B requires the study to examine the extent to which NO_x reductions may contribute, or be counterproductive, to state programs to attain the national ambient air quality standard for ozone. It also specifies that the study look at the sensitivity of ozone to NO_x control, the availability of NO_x controls, the role of biogenic—or natural—VOC emissions, and the information required for air quality models.

The report that EPA recently issued was-actually a series of four different reports and papers—1) the National Academy of Sciences Report entitled "Rethinking the Ozone Problem in Urban and Regional Air Pollution," 2) an EPA report providing overview and comment on the National Academy study, 3) an EPA report on the availability of NO_x controls, and 4) a summary of public comments received on the draft of the overview document I just mentioned. I would like to discuss with you some of the key findings of the Academy report and the EPA reaction to those findings, as included in the technical report we issued last week.

The National Academy of Sciences issued its report in 1991. EPA was one of the original co-sponsors of the report and, on the whole, agrees with most of its findings. The Agency has already moved to implement many of its recommendations. Included among the report's recommendations were the following:

- More statistically robust methods should be developed to assist in tracking progress in reducing ozone.
- Improved ambient monitoring of VOCs and NO_x is necessary to verify emission inventories and monitor progress in reducing emissions.
- Improved estimates of biogenic (natural) and anthropogenic (man-made) VOC emissions must be developed.
- New measurement Strategies that incorporate more accurate and precise measurements of individual trace compounds involved in ozone chemistry should be developed to better understand ozone formation and to verify emissions of NO_x and VOCs.
- Control of NO_x emissions will probably be necessary in addition to, or instead of, the control of VOCs in some areas.
- Uncertainties exist in control strategy development; improvements are needed in underlying science data bases to reduce these uncertainties; and
- Because of uncertainties, mandated use of specific alternative fuels would be premature and coordinated studies are needed to determine which fuels are best suited to a specific region.

While the report included these important conclusions and recommendations, I believe it is important to point out some of the things that the National Academy of Sciences report did not say. Although the Academy pointed out uncertainties in the role of VOCs in ozone formation, it did not say that we lack a scientific understanding of ozone formation. Nor did it say that a single approach to ozone precursor control is feasible for all regions of the country. Nor did it say that V0C controls would not continue to play an important role in many areas.

As I mentioned, one of the key documents we issued last week responded to the most significant issues raised by the National Academy of Sciences. I would like to take a moment to walk through some of the key issues in our response to the Academy report.

The Academy reported that, though sound in design, the state implementation plan process is flawed in practice because of the lack of an adequate program to verify whether control programs meet projected emission reductions. We agree and have designed and are working with the states to implement a new monitoring program to track reductions in various emissions and progress towards attainment. When fully implemented, this network—called the Photochemical Assessment Monitoring System (PAMS)—will be a major step toward providing information needed to make mid-course adjustments in the state implementation plan process. However, the PAMS network will not be able to provide information for modelling needed for 1993 SIP submittals (moderate areas) and 1994 submittals (serious, severe and extreme areas) for which states will have to rely on existing inventories and models, flawed as they are, as noted by the Academy. PAMS and other EPA efforts to improve models and inventories will only be available for mid-course correction. In addition, EPA is encouraging application of major field and monitoring studies, such as the Lake Michigan Ozone Study and the Southern Oxidant Study, to refine modelling and assess progress in meeting state implementation plan requirements.

Currently, EPA is looking into the use of public-private partnerships to help implement the PAMS network and undertake the major monitoring and field studies.

The Academy report confirms research findings that biogenic, or natural, VOC emissions have significant impacts on ozone formation, although the extent of emissions is not well established. EPA is requiring that biogenic emissions be included in

the photochemical grid model applications required to assess the effectiveness of emission control strategies in ozone areas classified as "serious, severe or extreme" under the 1990 Amendments. We believe that the large uncertainty in biogenic emission estimates demands that a high priority be placed on characterizing natural emissions. EPA currently is learning more about biogenic emissions in the southeastern United States as part of the Congressionally mandated Southern Oxidant Study.

The Academy also reported that so-called grid models (complex models that better reflect special distribution of sources and pollution compared with simpler linear models) are preferred control strategy assessment tools, although parts of the model structure and required input data contain important areas of uncertainty. The report states that EPA has not considered model uncertainties in developing emission control programs. EPA agrees that the models and the input data contain uncertainties. However, we require the use of the best available models and data bases within practical resource and time constraints. EPA and the Academy agree that research to reduce model uncertainties is a very high priority. The Agency is attempting to address this through new requirements for enhanced monitoring programs, revamped emission inventories, and improved photochemical grid modelling. All of these will help provide more realistic inputs to the air quality models states use to demonstrate attainment with the ozone standard, although many of these improvements will not be available for 1993 and 1994 mandatory SIP submittals.

The Academy reported that NO_x control is necessary for effective reduction of ozone in many areas, and that NO_x control should be emphasized more than it has been under past EPA strategy, although NO_x controls could increase ozone formation in certain urban areas. EPA agrees that NO_x control is expected to lead to ozone reductions in many areas. Area-specific and regional analyses using photochemical grid models, as required in the more polluted areas by the 1990 Amendments, will be used to assess the effectiveness of alternative control strategies. As more data become available, EPA plans to encourage any mid-course corrections that may be warranted to state implementation plans in ozone nonattainment areas. In the meantime, we are implementing the VOC and NO_x control programs required under the nonattainment, mobile sources, air toxics and acid rain provisions of the Clean Air Act. The Agency is also developing guidance to assist states in determining where NO_x controls are and are not beneficial.

In November 1993, states in ozone nonattainment areas classified as "moderate" and above are required to submit plans to EPA demonstrating a 15 percent reduction in emissions of VOCs by the end of 1996. The Act requires areas classified as "serious" and above to implement programs after 1996 that will obtain a 3 percent per year reduction in VOCs until that area attains the standard. Although the Clean Air Act does not appear to give us the flexibility to allow states to substitute NO_x for VOC controls in meeting the "15 percent" requirement, the Act does permit us to allow that substitution in meeting the subsequent 3 percent per year requirement. We will allow that substitution where the science shows it to make sense, and we are now developing guidance for states on NO_x substitution.

The Academy report concluded that alternative fuels by themselves will not solve the ozone problem and that requiring widespread use of any one fuel would be premature. As you know, in the Clean Air Act Congress mandated several clean fuels programs. These programs include cleaner burning gasoline and diesel fuel and also provide the opportunity for the introduction of non-petroleum, alternative fuels. Clean fuels, such as reformulated gasoline, alcohol fuels and gaseous fuels, offer substantial VOC reductions, as well as potential for NO_x reductions, although the exact effect on ozone will vary from area to area.

Finally, the Academy report concluded that a coordinated national ozone research program is needed. EPA agrees with this assessment and has made a commitment to initiate the implemention of the recommendation. Working with other Federal and state agencies (including the National Oceanic and Atmospheric Administration, the California Air Resources Board, and the Texas Air Control Board, among others), EPA has begun a serious public/private sector research coordination effort for base programs and has completed a joint effort to identify and plan needed additional ozone research. EPA's Office of Research and Development convened a group of 140 senior scientists representing a cross-section of disciplines and public and private organizations to design the national research initiative. It identifies the key questions and corresponding projects needed to effectively address the ozone problem.

The next step is to secure funding partnerships, through a combination of government and private funding, to begin as much of the priority research as possible. EPA has asked the National Academy of Sciences to extend the function of its 185B

Committee on Tropospheric Ozone Formation and Measurement to serve in an advisory and peer review capacity in setting up the coordinated national research program.

In short, Mr. Chairman, we agree with most of the points raised in the Academy study and have or are taking steps to implement them. We are doing so in the context of available and foreseeable resources and within the constraints of the timeframes mandated under the Clean Air Act. In the meantime, it is important to note that we are moving ahead to implement the provisions of the Clean Air Act by issuing national rules that require reductions in NO_x, as well as, VOC emissions. For example, we have issued final rules that require a 60 percent reduction in NO_x tailpipe emissions from cars and light duty trucks, beginning in model year 1994. We have also issued rules requiring stricter NO_x standards for heavy duty diesel engines used in large trucks and buses. Our enhanced vehicle inspection and maintenance programs will also result in nine percent reductions in NO_x emissions from mobile sources in "serious, severe and extreme" ozone areas. In addition, we have proposed regulations which for the first time would establish NO_x emission standards for large diesel engines used in nonroad applications, such as farm and construction equipment.

We also have proposed rules that will require utilities affected by the acid rain provisions of the Act to significantly reduce NO_x emissions and, at the same time we issued guidance to states defining reasonably available control technology for NO_x from major sources, such as utilities, in ozone nonattainment areas. In total, we expect that by the year 2000 these programs will result in a four million ton/year reduction of NO_x from 1990 levels.

Mr. Chairman, you also asked that I comment on EPA's March 1, 1993 decision not to revise the primary and secondary ozone standard. In response to an American Lung Association lawsuit, the U.S. District Court for the Eastern District of New York issued an order requiring EPA to propose a decision on whether to revise the ozone standard by August 1, 1992, and to issue a final decision by March 1, 1993.

Given the very short timeframes associated with the Court's decision, the former EPA Administrator determined that he would have to base that decision on the available documentation, including the 1986 ozone criteria document, the subsequent supplement to that document, the 1989 EPA staff paper on the issue, and the advice and recommendations of the Clean Air Scientific Advisory Committee.

At the time of our March 1993 decision on this matter we recognized that close to 1,000 new ozone studies—including studies that looked at longer term exposure to ozone—had been published in the scientific literature since 1987 and that these all would have to be evaluated before we could make a decision regarding the level or format of the standard. The results reported in some of the studies are clearly of concern to us. However, as of the March 1993 court-ordered deadline, it was premature to draw conclusions on either the scientific merit or the ultimate implications of particular studies because they had not been subjected to the rigorous and comprehensive assessment by EPA or the Clean Air Science Advisory Committee called for in the Clean Air Act.

At the time of the March decision, the Administrator determined that the air quality documentation available to her which was fully reviewable did not provide a sufficient basis for revising the existing ozone standard. However, recognizing the importance of the new studies, EPA instituted a process to expedite the review of the studies and determine whether any change to the ozone standard is warranted.

In March 1993, our new Administrator, Carol Browner, called on EPA staff from various offices to develop recommendations for an expedited process to review the ozone studies available since 1989. After a review of the recommendations, the Administrator determined that EPA will undertake an accelerated review of the ozone standard, with a goal of completing the review by mid-1997. Her decision to complete review of the standard on this timeframe is the fastest, most realistic schedule possible, particularly given the complexity of the science and the need to ensure that we have a strong scientific consensus to adequately support the regulatory decisions.

I think it is important to stress that while the scientific debate about the standard continues, EPA has taken unprecedented steps over the past two years to reduce emissions of pollutants that cause ozone. In addition to the NO_x control measures I mentioned earlier, we have issued a series of rules that will significantly reduce ozone-forming VOC emissions as well. For example, our Phase I and Phase II gasoline volatility rules are causing far less evaporation of gasoline vapors today than in years past and, beginning in 1996, cars themselves will have more efficient systems to control evaporative emissions. We also issued rules requiring a 30 percent reduction in tailpipe VOC emissions from new cars beginning with model year 1994. Our

final rules for enhanced vehicle inspection and maintenance programs will reduce VOC emissions from motor vehicles by 28 percent. Our proposed reformulated gas program for the nine dirtiest cities will achieve in 1995 a 15 percent reduction in VOCs and air toxics from mobile sources and even greater reductions in 2000 and beyond.

We have taken a series of regulatory actions in the stationary source arena, as well. Though not required by the Act, we issued a document called the General Preamble to provide detailed guidance to states on implementing the nonattainment provisions of the Act. EPA regions worked with the states to ensure that states submitted implementation plans that would "fix" existing reasonably available control technology (PACT) rules. States have put into place all of the approximately 1600 state rule changes that were required by the Clean Air Act. We have proposed or issued several other rules that will also reduce emissions of VOCs. These include final rules on outer continental shelf sources; proposed transportation and general conformity rules; proposed rules limiting emissions from municipal landfills; proposed rules limiting emissions from chemical manufacturing facilities (known as the "HON"); final alternative control technique (ACT) document for VOCs from bakeries and pesticide applicators; and a final air toxics early reduction rule (which has substantial VOC reductions associated with it). We also have eight draft control technique guideline (CTG) documents that are available for states to use this summer. We expect one of those documents addressing two CTGs—synthetic organic chemical manufacturing industry (SOCMI) reactor process vents and SOCMI distillation process vents to be issued soon weeks. We are also developing several ACT documents for sources of NO_x. In addition, we have a series of ongoing efforts ranging from our work with the Ozone Transport Commission, composed of the northeastern states, to major studies like that on consumer and commercial products which will also have significant, positive benefits in reducing emissions of ozone precursors.

Mr. Chairman, this concludes my written statement. I will be happy to answer any questions that you may have.

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